

UPPER COLUMBIA RIVER

FINAL Northern Pike Tissue Study Data Summary Report

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ACRONYMS AND ABBREVIATIONS

ACG	analytical concentration goal
ALS	ALS Environmental
CCT	Confederated Tribes of the Colville Reservation
CH2M	CH2M HILL
COI	chemical of interest
DL	detection limit
DQO	data quality objective
ESI	Environmental Standards, Inc.
EPA	U.S. Environmental Protection Agency
FSR	field summary report
GPS	global positioning system
HHRA	human health risk assessment
ID	identification
LCS	laboratory control sample
MQO	measurement quality objective
MRL	method reporting limit
MS/MSD	matrix spike/matrix spike duplicate
NPS	National Park Service
PARCC	precision, accuracy or bias, representativeness, comparability, and completeness
QC	quality control
QAPP	quality assurance project plan
RI/FS	remedial investigation/feasibility study
RL	reporting limit
RM	river mile
STI	Spokane Tribe of Indians
TAI	Teck American Incorporated
TL	total length
UCR	Upper Columbia River
WDFW	Washington Department of Fish and Wildlife
WDOH	Washington Department of Health

UNITS OF MEASURE

C	Celsius
dw	dry weight
ft	foot/feet
g	gram(s)
mm	millimeter(s)
ww	wet weight

1 INTRODUCTION

This report presents the results of the 2018 Northern Pike tissue study (herein referred to as the study) conducted by CH2M HILL (CH2M) on behalf of the U.S. Environmental Protection Agency (EPA) and Teck American Incorporated (TAI) for the Upper Columbia River (UCR) Site, herein referred to as the Site.¹ The study was planned to determine if the consumption of Northern Pike collected from the Site results in human health risks. Northern Pike were not sampled as part of the 2009 fish tissue sampling study, because they were not known to be established in the Site until 2011 (CH2M HILL and SRC 2018). Since then, this nonnative species has increased in abundance and become the top predator in the UCR. Consequently, the Confederated Tribes of the Colville Reservation (CCT) has implemented a payment reward system for anglers who remove Northern Pike from the UCR. Northern Pike are commonly consumed by anglers, and this recent incentive to catch and remove this species may encourage consumption of Northern Pike caught in the UCR Site. Therefore, chemical analyses were conducted on Northern Pike tissues collected from the Site to determine if their consumption poses unacceptable health risks to humans (CH2M HILL and SRC 2018).

For the 2018 Northern Pike study, sampling and analyses were conducted as described in the quality assurance project plan (QAPP) prepared for EPA (CH2M HILL and SRC 2018); the QAPP is Addendum No. 2 to the 2009 fish tissue study QAPP (Parametrix et al. 2009). This study was conducted as part of the remedial investigation/feasibility study (RI/FS) for the Site. The study objective was to supplement the original data quality objectives (DQOs) of the 2009 fish tissue study by providing data that could be used to evaluate potential exposure to chemicals of interest (COIs) by humans consuming Northern Pike from the Site.

To meet the study objective, tissue samples were collected by the Lake Roosevelt Fisheries Co-Managers² on July 24 through 26, 2018, as part of the Northern Pike suppression effort. Fish were captured in the area between Gifford and Northport, Washington, using gill nets (CH2M HILL 2018). Composites of Northern Pike fillets representing two fish size classes were analyzed for conventional parameters and metals/metalloids, as specified in the QAPP addendum (CH2M HILL and SRC 2018). The size classes were defined as 300 to 449 mm total length (TL) and greater than or equal to 450 mm TL; these classes represent the sizes harvested at the time of sampling (CH2M HILL and SRC 2018). Since Northern Pike are a recently

¹ The Site, as defined in the June 2, 2006, Settlement Agreement (USEPA 2006), is “the areal extent of hazardous substances contamination within the United States in or adjacent to the Upper Columbia River, including the Franklin D. Roosevelt Lake (“Lake Roosevelt”), from the border between the United States and Canada downstream to the Grand Coulee Dam, and all suitable areas in proximity to such contamination necessary for implementation of the response actions....”

² Lake Roosevelt Fisheries Co-Managers include the CCT, the Spokane Tribe of Indians (STI), and the Washington Department of Fish and Wildlife (WDFW). WDFW did not participate in the 2018 Northern Pike field activities.

established invasive species to the Site, the size demographics of the population may shift to include larger individuals over time.

1.1 STUDY PURPOSE AND DATA QUALITY OBJECTIVES

The DQO process summarized in the QAPP addendum (CH2M HILL and SRC 2018) identified an approach for filling a data gap pertaining to the characterization of potential risk associated with the human consumption of Northern Pike from the Site. As part of the DQO process, the following two primary goals of the study were identified:

- To provide information for use in the human health risk assessment (HHRA) to determine whether COIs in Northern Pike tissue from the Site pose an unacceptable risk to human health; and
- To provide data required by the Washington Department of Health (WDOH) to evaluate the need for a fish advisory for UCR Northern Pike.

1.2 REPORT ORGANIZATION

This report is organized into the following sections:

- **Section 1—Introduction.** This section provides background information, identifies the purpose of the study, and outlines the organization of the report.
- **Section 2—Study Design and Methods.** This section describes the study design and sampling locations and the methods used for collecting, compositing, and analyzing fish tissues.
- **Section 3—Quality Assurance Project Plan Modifications and Deviations.** This section discusses deviations from the QAPP.
- **Section 4—Validation Assessment.** This section provides a summary of the data validation assessment of the analytical results.
- **Section 5—Results.** This section presents a summary of the analytical results.
- **Section 6—Summary.** This section presents a summary of the study.
- **Section 7—References.** This section presents bibliographic information for the documents cited in this report.

Figures, maps, and data tables are provided following Section 7. Data tables presented herein have been provided in electronic format, including raw data (provided on CD-ROM). Data may also be obtained directly from the project database, accessible at: <http://teck-ucr.exponent.com>.

2 STUDY DESIGN AND METHODS

This section summarizes the study design and methods, including field collection and laboratory methods. Additional details of the study plan are presented in the QAPP addendum (CH2M HILL and SRC 2018).

2.1 STUDY DESIGN

The 2018 Northern Pike tissue sampling study targeted locally abundant Northern Pike to provide data to support the HHRA and for WDOH to assess if a fish consumption advisory is needed for Northern Pike. Lake Roosevelt Fisheries Co-Managers (CCT and STI) personnel collected Northern Pike from the Site on July 24 through 26, 2018. Whole fish were provided to CH2M/EPA personnel for tissue filleting prior to chemical analysis.

The following sections provide details on the Northern Pike size classes collected, tissue sampling, sampling locations, analyte list, analytical methods, sampling and collection methods, biological measurements, and sample compositing. Additional details on the study design and rationale are presented in Section 3 of the QAPP addendum (CH2M HILL and SRC 2018) and in the field summary report (FSR; Appendix A). Details regarding the fillet compositing plan are presented in Appendix B.

2.1.1 Northern Pike Size Classes

Two size classes of Northern Pike were captured to provide data representative of COI concentrations in Northern Pike that might be consumed by humans. Size class A represents Northern Pike in the range of 300 to 449 mm TL, and size class B represents Northern Pike 450 mm TL and larger. The lengths of individual Northern Pike in each size class are shown in Figure 2-1.

2.1.2 Tissue Sampling

Northern Pike were skinned and filleted in the field, and skinless fillets were composited for chemical analysis at the laboratory. Composite samples were prepared according to the sample compositing plan (Appendix B), as described in Section 2.1.6 of this report.

2.1.3 Sample Locations

Individual fish were collected between approximately river mile (RM) 699 and RM 711 (Map 2-1). The average spatial location of each composite sample (calculated by averaging the river mile associated with each individual fillet of a composite) is shown on Maps 2-1 through 2-13. As specified in the QAPP addendum (CH2M HILL and SRC 2018), Northern Pike

collected for this study are considered spatially representative of Northern Pike throughout the Site at the time that sampling was conducted in 2018. The average river mile locations serve only to assign a location to each composite sample in the project database.

2.1.4 Sampling Effort and Collection Methods

Northern Pike were collected via gill netting, and whole fish were provided to CH2M for processing. The sampling team recorded the global positioning system (GPS) coordinates (latitude and longitude) where fish were caught (i.e., point coordinates for gill nets). CH2M performed all duties and responsibilities for sample preparation, sample collection, and sample handling.

A total of 60 Northern Pike were collected for compositing and chemical analysis. The length and weight of each fish, as well as other field collection and fillet processing information, are provided in the FSR (Appendix A).

Fish Collection and Handling

The sampling team measured Northern Pike for TL (mm) after the fish had been removed from the gill net. Specimens were euthanized by the sampling team using a sharp blow to the head, and they were careful not to break the skin of the fish. Fish meeting the size class requirements for tissue sampling were transferred to CH2M for processing.

Tissue Sample Processing

All tissue processing was performed on a boat operated by the National Park Service (NPS). Fish were processed either while the boat was beached on shore to provide a stable platform, or if the water was calm, while the boat floated in water deeper than 50 ft. The fish were held in decontaminated plastic tubs prior to processing.

Fish were photographed and examined for external abnormalities³, weighed, and filleted with skin removed. At least 40 g ww of fillet was collected, wrapped in foil, labeled, double-bagged in resealable plastic bags, and placed in a cooler on ice. During filleting, no internal organs were punctured.

Equipment Decontamination

The field team thoroughly rinsed all sampling equipment that came into contact with fish, both between samples and upon completion of the study.

³ The primary external abnormalities noted by the field crew were damaged or frayed fins and damaged or missing eyes. Abnormalities noted for each fish are reported in Appendix B of the FSR (Appendix A).

Rinsing was performed, using river water, both away from the shoreline and any areas where sediment had been disturbed during beaching of the boat. Equipment used to process the fish was washed with soap (i.e., Alconox™) and rinsed with river water and distilled water after each use. Clean gloves were worn when handling each fish to avoid transfer of potential contaminants among samples.

Fish Identification

Individual fish were identified with the letters “EPA,” a species abbreviation, length group, and sequential number (e.g., EPA-NP-A-001). Individual fish identification (ID) codes included the following information:

- Species = Northern Pike (NP)
- Length group as follows
 - A = 300 to 449 mm TL
 - B = $\geq$ 450 mm TL
- Sequential fish number expressed as three digits, starting with 001 (e.g., 001 or 002)

The example fish identifier code EPA-NP-A-001 represents the first Northern Pike collected in the 300- to 449-mm TL size class.

Composite Identification

Northern Pike composites were identified with the letters “EPA,” the species abbreviation “NP,” and the length group (i.e., A or B) with a sequential number starting with 1. For example, composite ID EPA-NP-A1 represents the first Northern Pike composite in the 300- to 449-mm size class.

2.1.5 Analyte List and Analytical Methods

Target analytes were specified in the QAPP addendum (CH2M HILL and SRC 2018) and are presented in Table 2-1. Standard EPA-approved analytical methods (Table 2-2) were used for this study; these methods had detection limits (DLs) sufficiently low to provide concentration data below risk-based benchmarks when possible (Table 2-1). Analytical laboratory procedures—including tissue homogenization, compositing, and metals/metalloids and conventional parameter analyses—were performed by ALS Environmental (ALS) in Kelso, Washington.

2.1.6 Sample Compositing

A plan for compositing individual Northern Pike fillets into size class-specific composites was developed after the field sampling program was complete. The compositing plan was

determined by EPA and communicated to TAI on July 27, 2018. A stratified random approach based on the total length of each fish was used to assign fillets to a composite (Appendix B). The capture locations of the 60 fish assigned to the 12 composites are shown on Maps 2-1 through 2-13.

Fillet composites were prepared by ALS. Each fillet was homogenized individually, and equal masses of homogenate from five fillets of the same size class were combined based on assignments in the compositing plan (Appendix B). The composites were then freeze-dried, homogenized, and subsampled for analysis. Leftover tissue homogenate was archived at -20° C.

3 QUALITY ASSURANCE PROJECT PLAN MODIFICATIONS AND DEVIATIONS

This section provides a description of deviations from the QAPP (CH2M HILL and SRC 2018) that occurred during the study and how these changes affected data quality. All field activities were performed in accordance with the QAPP; there were no field deviations (Appendix A). The following laboratory deviations occurred:

- The laboratory did not measure the cooler temperature upon receipt of the samples. ALS sample-receiving personnel noted that the fish tissues were frozen and packed with sufficient dry ice. The samples were immediately placed in a freezer and stored at -20° C. This deviation is not expected to have affected data quality, because the tissues remained frozen during sample transport and receipt. The laboratory conducted a nonconformance evaluation at TAI's request and implemented corrective action, which included reviewing the sample receipt and documentation procedures with the sample-receiving technician. The laboratory provided TAI with a nonconformance corrective action report.
- More rinsate and homogenization blanks were prepared by the laboratory than were required by ALS's tissue preparation standard operating procedure. One rinsate blank was prepared for each day of sample processing, instead of one rinsate blank per batch of samples. Two homogenization blanks instead of one were prepared for each day of sample processing. For the purposes of data validation, the blank results were pooled for each sample processing day, and the highest value of each analyte was used to evaluate contamination. This deviation is not expected to have affected data quality, because the additional data provided more conservative blank concentrations.

4 VALIDATION ASSESSMENT

Data validation was performed by Environmental Standards, Inc. (ESI) of Valley Forge, Pennsylvania, in accordance with the QAPP addendum (CH2M HILL and SRC 2018) and based on EPA guidance from applicable analytical methods and the following documents:

- *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA 540-R-08-005) (USEPA 2009)
- *National Functional Guidelines for Inorganic Superfund Methods Data Review* (EPA 540-R-2017-001) (USEPA 2017).

Stage 4 validation was conducted for all data. Data were qualified, as needed, based on an evaluation of the following quality control (QC) criteria:

- Holding times
- Condition of samples upon laboratory receipt
- Sample preparation
- Initial and continuing calibrations
- Blank results
- Matrix spike/matrix spike duplicates (MS/MSDs) results
- Laboratory control sample (LCS) results
- Laboratory duplicate and triplicate results
- Standard reference material results
- Reporting limit (RL) standard results
- Interference check sample results
- Serial dilution results
- Internal standard performance
- Instrument sensitivity
- Analytical sequence and quantitation of positive results.

The ESI data validation report is provided in Appendix C and is also available on the Downloads page of the project database (<http://teck-ucr.exponent.com>). The results of the data validation for overall data quality of chemistry results, sample transport and holding times, equipment blank data, and tissue data are summarized in Sections 4.1, 4.2, 4.3, and 4.4, respectively.

4.1 OVERALL DATA QUALITY

Chemistry data for equipment blanks (i.e., rinsate and homogenization blanks) and fish tissues met quality requirements in accordance with the QAPP addendum (CH2M HILL and SRC 2018). A summary of the qualifiers assigned to equipment blank and tissue results is presented in Tables 4-1 and 4-2, respectively. No data were rejected and all data are usable with the qualifiers presented. The following data qualifiers were applied by ESI:

- J—The result was considered estimated. For this dataset, J flags were applied due to serial dilution imprecision and for results between the DL and the RL.
- J- —The result was considered estimated and may be biased low. For this dataset, J- flags were applied due to low MS/MSD recovery or negative instrument bias.
- U—The analyte was not detected at or above the DL.
- U*—The analyte was considered not detected because a similar concentration was detected in an associated blank sample. For results qualified as U*, the DL was changed to the concentration of the qualified result. The RL was also changed to match the qualified result if the result exceeded the RL.
- UJ—The analyte was not detected and the DL was considered approximate due to bias identified during the QA review.

Data quality indicators for precision, accuracy or bias, representativeness, comparability, and completeness (PARCC) were specified in the QAPP addendum (CH2M HILL and SRC 2018), and measurement quality objectives (MQOs) were listed in Table B-4 of the 2009 fish tissue QAPP (Parametrix et al. 2009). The data validator used the project-specific MQOs to evaluate Northern Pike tissue data for the quantitative components of PARCC (i.e., precision and accuracy or bias). Duplicate relative percent differences and triplicate relative standard deviations were used to assess precision. The evaluation of accuracy and bias was based on the results of QC sample analyses, such as MSs, internal standards, and equipment and method blanks. The data validator also assessed sample handling, laboratory methods, and holding times to evaluate the representativeness and comparability of analytical data. Data were qualified as necessary by ESI when MQOs were not met. A data completeness goal of 95 percent was specified in the QAPP (Parametrix et al. 2009). Data completeness was 100 percent for all analyte groups.

The following sections discuss the data review findings and reasons qualifiers were applied by the data validator. Laboratory QC samples (i.e., laboratory duplicate and triplicate samples) were included in the validation assessment, and are, therefore, also indicated in the qualifier counts in Sections 4.3 and 4.4. Tables 4-1 and 4-2 show both the numbers of qualifiers applied by the analytical laboratory and the numbers of qualifiers applied by the data validator. These

sections also summarize the data validation results for sample transport and holding times, equipment blanks, and tissue data.

4.2 SAMPLE TRANSPORT AND HOLDING TIMES

There were no issues related to sample transport or holding times. Samples were received frozen by the laboratory and placed in frozen storage until processing. Samples were prepared and analyzed within the holding times specified in the QAPP addendum (CH2M HILL and SRC 2018).

4.3 EQUIPMENT BLANK DATA

This section summarizes equipment blank (i.e., homogenization and rinsate blanks) concentrations and data qualifiers applied to equipment blank results. Data qualifiers are summarized in Table 4-1.

Equipment blank concentrations were compared to the tissue data on the same unit basis (i.e., parts per million) in order to evaluate contamination. As described in Section 3.1, extra equipment blanks were prepared by the laboratory. Data for the additional blanks were pooled for each sample processing day, and the highest value of each analyte was used by ESI to evaluate contamination. Several metals were detected in the homogenization blanks and equipment blanks (see Table 4-3). Of these, 84 percent were between the DL and the RL; of the metals detected in the blanks above the RL, most were only slightly above it, with the exception of zinc in one rinsate blank. These results were evaluated by the data validator relative to the tissue sample results (Appendix C). None of the tissue sample results were qualified due to equipment blank contamination.

The only qualifiers applied to equipment blank results were due to negative instrument bias in the calibration blanks. Nondetected equipment blank results were UJ qualified for the following analytes and numbers of samples (numbers of laboratory QC samples⁴ qualified shown in parentheses):

- Iron—3
- Magnesium—1
- Manganese—9
- Sulfur—17 (1).

⁴ Laboratory duplicates.

Detected equipment blank results were qualified as estimated with a low bias (J- flagged⁵) for the following analytes and numbers of samples (numbers of laboratory QC samples⁶ qualified shown in parentheses):

- Magnesium—2
- Manganese—1 (1)
- Sulfur—1 (1).

4.4 METALS/METALLOIDS TISSUE DATA

This section summarizes data quality issues for metals/metalloids tissue results, including laboratory duplicate and triplicate samples as qualified by ESI based on an evaluation of various QC factors (e.g., LCS and MS/MSD recoveries, blank concentrations, and laboratory duplicate and triplicate results). Data qualifiers are summarized in Table 4-3. Tissue data were qualified due to calibration blank concentrations, low MS/MSD recoveries, and serial dilution imprecision, as detailed in the following subsections. All other QC parameters were within control limits.

4.4.1 Blanks

Tissue concentrations for iron were qualified as nondetected (U* flagged) due to the presence of iron in associated calibration blanks for three samples.

4.4.2 Matrix Spikes

Tissue concentrations were UJ qualified due to low MS recoveries for inorganic arsenic in 12 samples and 1 laboratory triplicate sample.

Tissue concentrations were qualified as estimated with a low bias (J- flagged⁷) due to low MS recoveries for the following analytes and numbers of samples (numbers of laboratory QC samples⁸ qualified are shown in parentheses):

- Inorganic arsenic—0 (1)
- Selenium—12 (2).

⁵ Unless J flagged; when sample results were qualified both as estimated with a low bias (J- flagged) and estimated with unknown bias (J flagged), only the unknown bias qualifier was included (see Appendix C).

⁶ Laboratory duplicates.

⁷ Unless J flagged; when sample results were qualified both as estimated with a low bias (J- flagged) and estimated with unknown bias (J flagged), only the unknown bias qualifier was included (see Appendix C).

⁸ Laboratory duplicate or laboratory triplicate samples.

4.4.3 Serial Dilutions

Tissue concentrations were qualified as estimated (J flagged) due to high serial dilution percent difference for the following analytes and numbers of samples (numbers of laboratory QC samples⁹ qualified are shown in parentheses):

- Copper—12 (2)
- Manganese—12 (2)
- Zinc—12 (2).

⁹ Laboratory duplicate or laboratory triplicate samples.

5 RESULTS

This section summarizes the Northern Pike tissue results and results of the analytical concentration goal (ACG) screen. A total of 12 Northern Pike fillet composites representing two size classes were analyzed for metals/metalloids and conventional parameters (i.e., lipid content, total solids).

Summary statistics for all COIs are presented in Tables 5-1 and 5-2 for small (300 to 449 mm) and large (≥ 450 mm) Northern Pike fillet composites, respectively. Metals concentration data are summarized on a dry weight basis, as reported by the laboratory, thereby facilitating comparison with ACGs. In addition, tissue concentration data for metals/metalloids are summarized on a wet weight basis (Table 5-3) to facilitate comparisons with previously reported data. Prior to summarizing tissue concentration data for metals on a wet weight basis, reported tissue concentration data were converted from a dry weight basis to a wet weight basis for each composite using the following equation: wet weight concentration = dry weight concentration $\times$ percent solids/100. Percent solids was measured for each composite sample and is reported in the project database. The chemical concentration data are also shown by size class in Figures 5-1 through 5-3. ACGs were compared to actual method reporting limits (MRLs) for nondetected metals results, as summarized below and in Table 5-4.

All composite fillet samples were analyzed for the following metals/metalloids and conventional parameters: aluminum, antimony, total arsenic, inorganic arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, sulfur, thallium, uranium, vanadium, zinc, percent lipids, and percent solids. Figures 5-1a through 5-1z, 5-2a and 5-2b, and 5-3a through 5-3z show dry weight metals/metalloids results, conventional results, and wet weight metals/metalloids results, respectively, for each Northern Pike fillet composite by size class.

ACGs, planned MRLs, and actual MRLs for metals/metalloids and conventional parameters are shown in Table 5-4. Actual MRLs were compared to ACGs for nondetected results and there were no exceedances.

6 SUMMARY

Consistent with the QAPP addendum (CH2M HILL and SRC 2018), 60 individual Northern Pike fillet samples were composited into 12 samples representing two different size classes. Composite tissue samples were analyzed in accordance with the QAPP addendum (CH2M HILL and SRC 2018) for COIs, including metals/metalloids and percent lipids and solids. The targeted number of Northern Pike was obtained for chemical analysis and data completeness was 100 percent. All samples had detected concentrations or nondetected MRLs that met the ACGs. No data were rejected as part of the data validation assessment and all data are considered usable with the qualifiers presented.

7 REFERENCES

- CH2M HILL and SRC. 2018. Quality assurance project plan—Upper Columbia River Northern Pike tissue study. Addendum No. 2 to the 2009 fish tissue study quality assurance project plan. Final.
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FIGURES

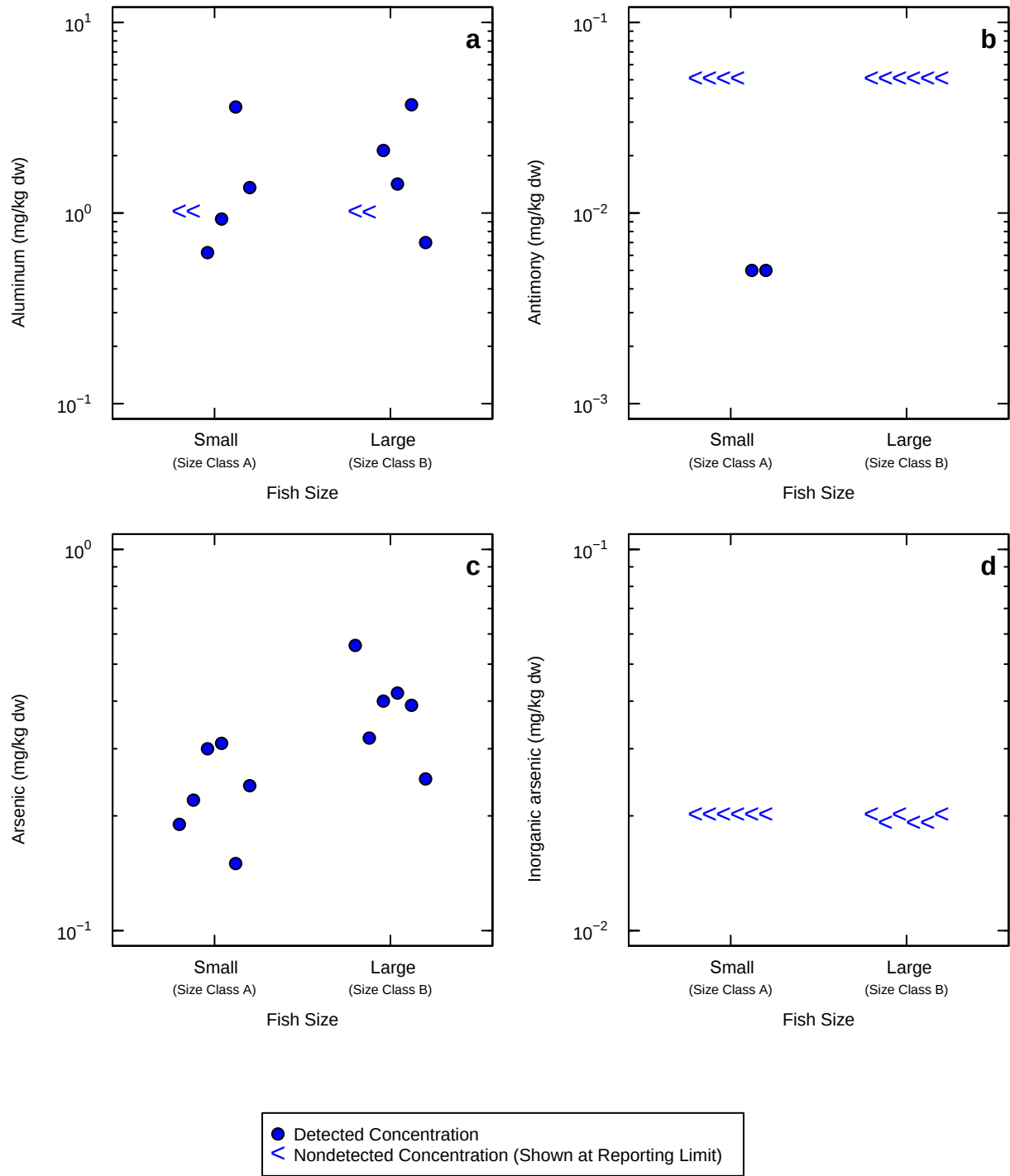


Figure 5-1a through d. Dry Weight Concentrations of Metals/Metalloids in Northern Pike Fillet Composites

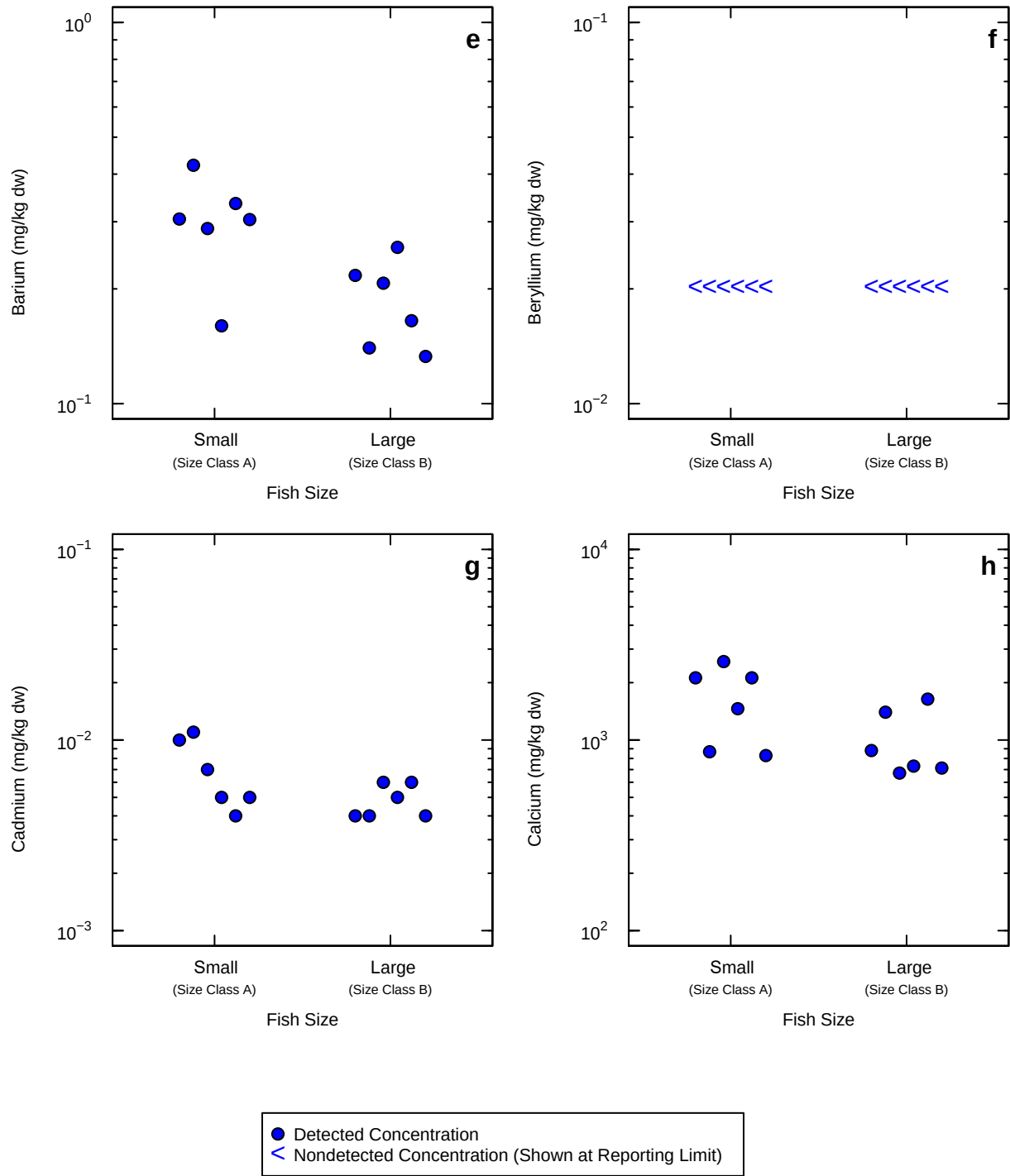


Figure 5-1e through h. Dry Weight Concentrations of Metals/Metalloids in Northern Pike Fillet Composites

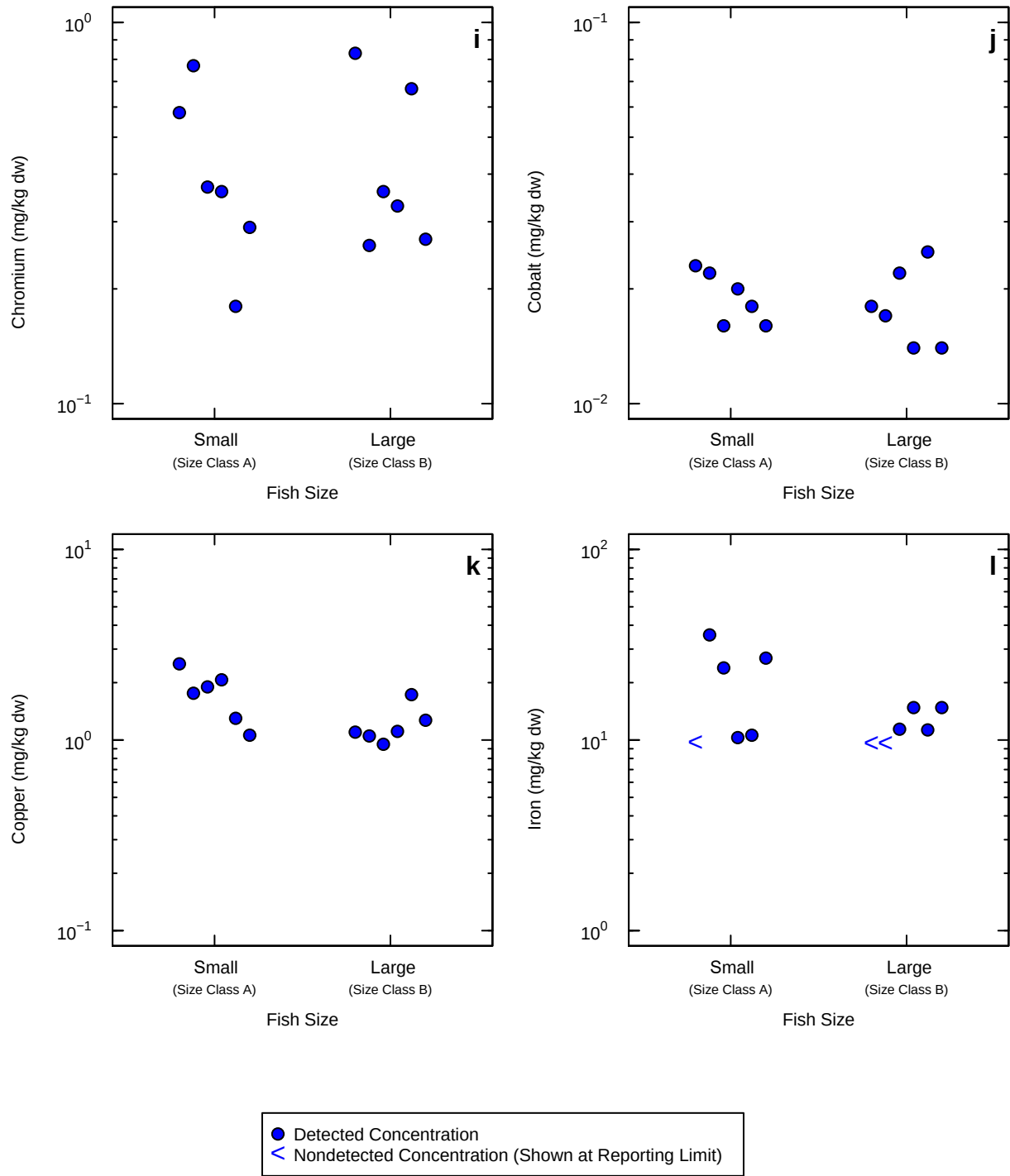


Figure 5-1i through l. Dry Weight Concentrations of Metals/Metalloids in Northern Pike Fillet Composites

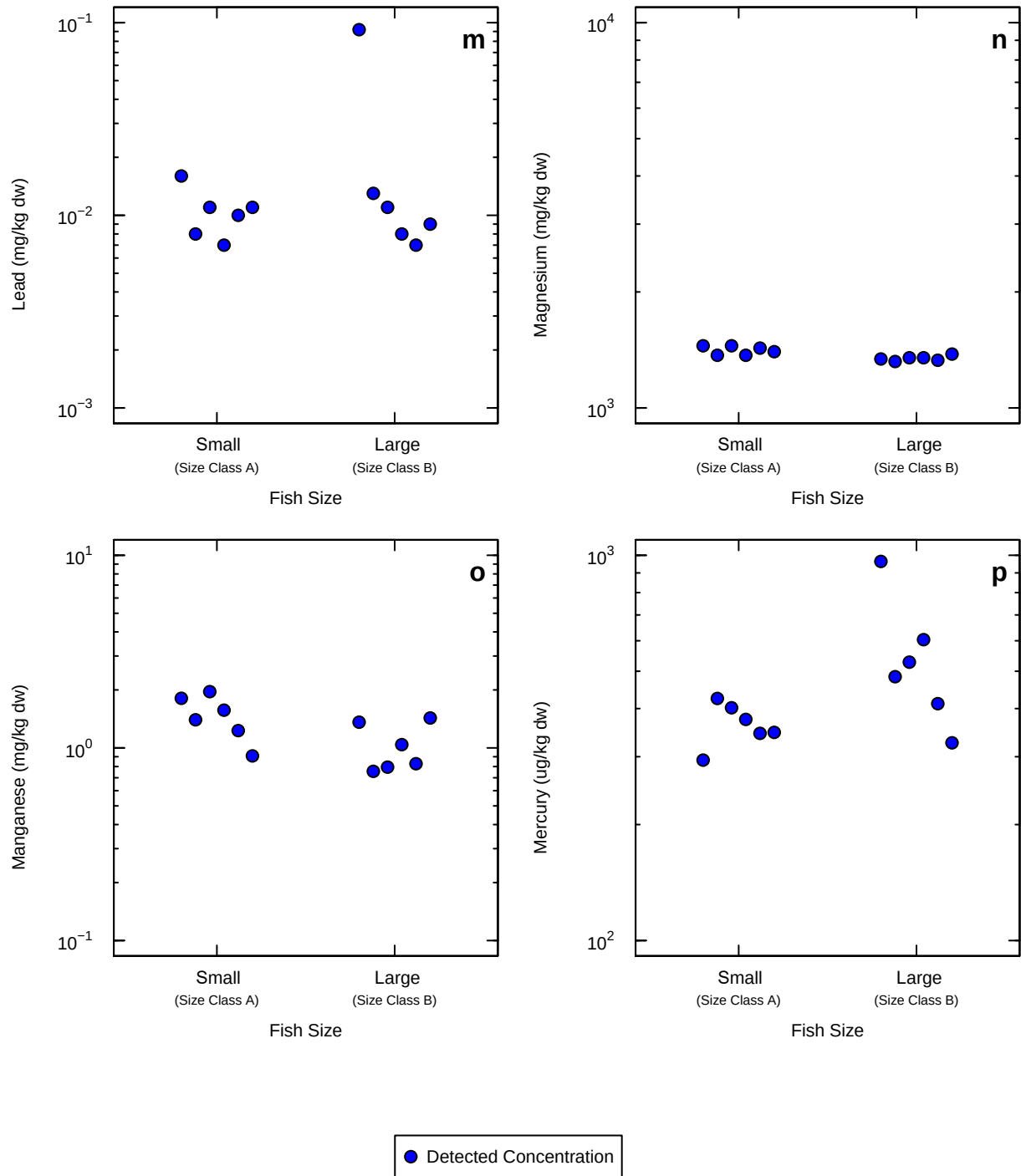


Figure 5-1m through p. Dry Weight Concentrations of Metals/Metalloids in Northern Pike Fillet Composites

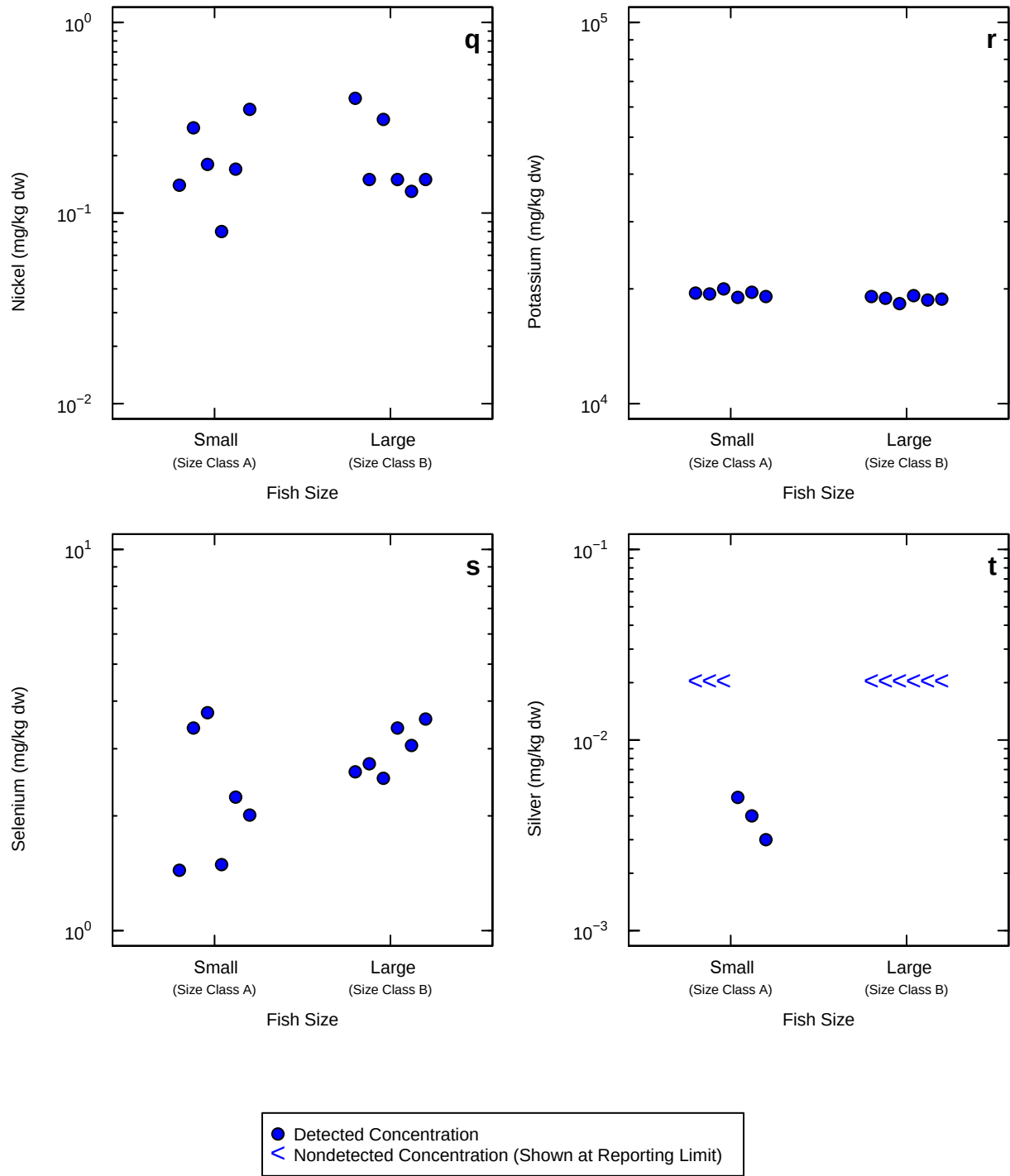


Figure 5-1q through t. Dry Weight Concentrations of Metals/Metalloids in Northern Pike Fillet Composites

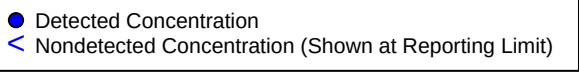
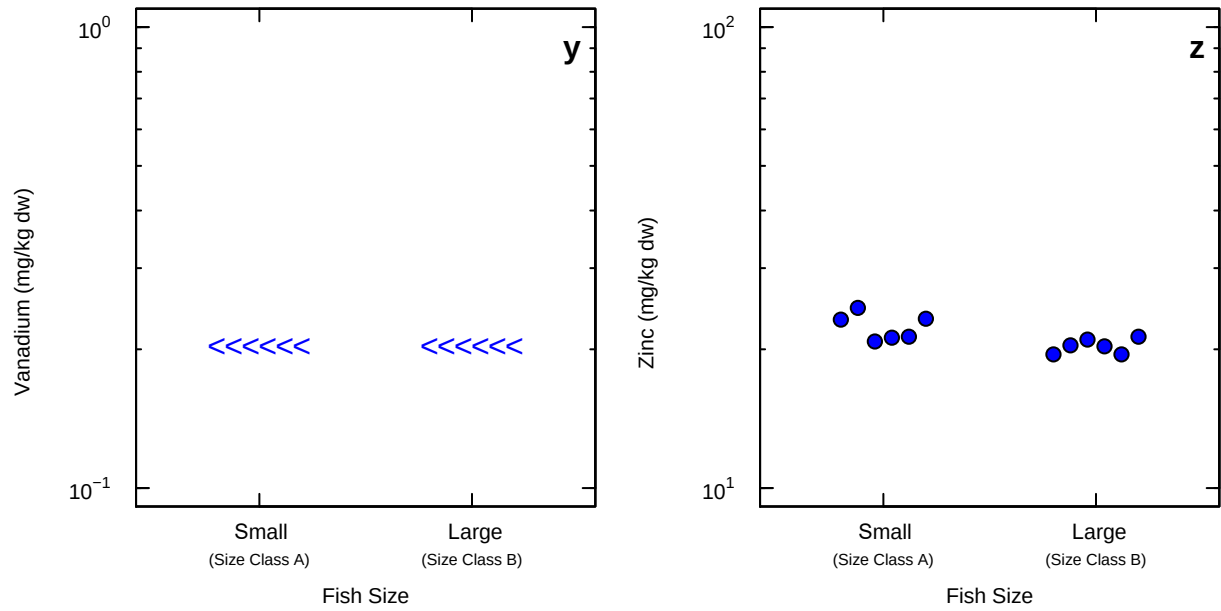


Figure 5-1y through z. Dry Weight Concentrations of Metals/Metalloids in Northern Pike Fillet Composites

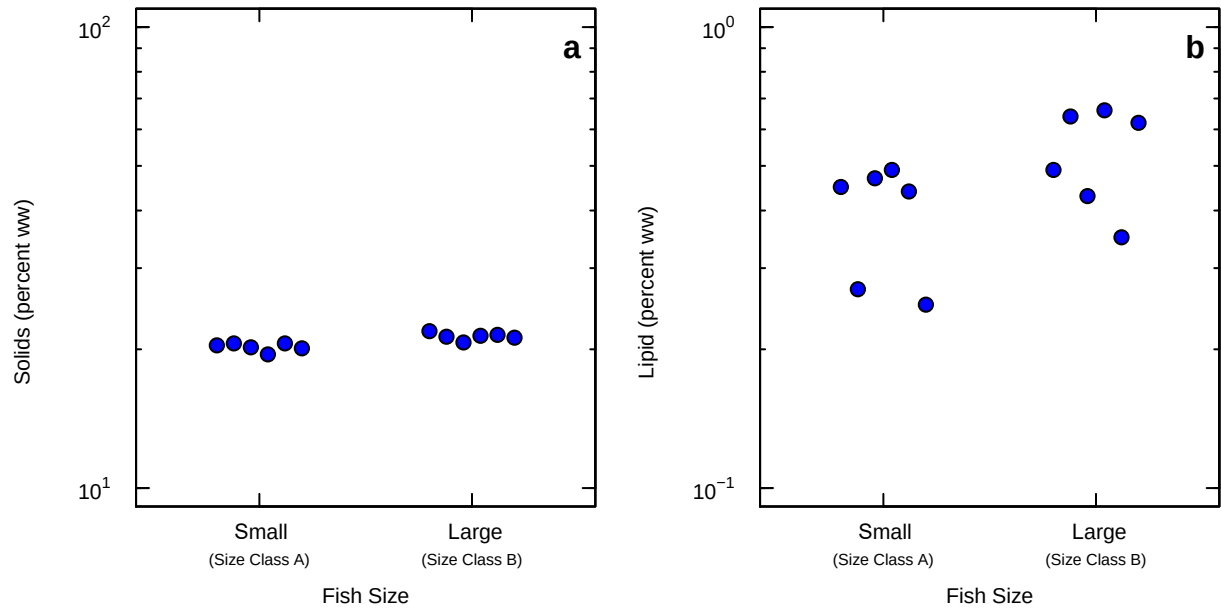


Figure 5-2a through b. Concentrations of Conventional Parameters in Northern Pike Fillet Composites

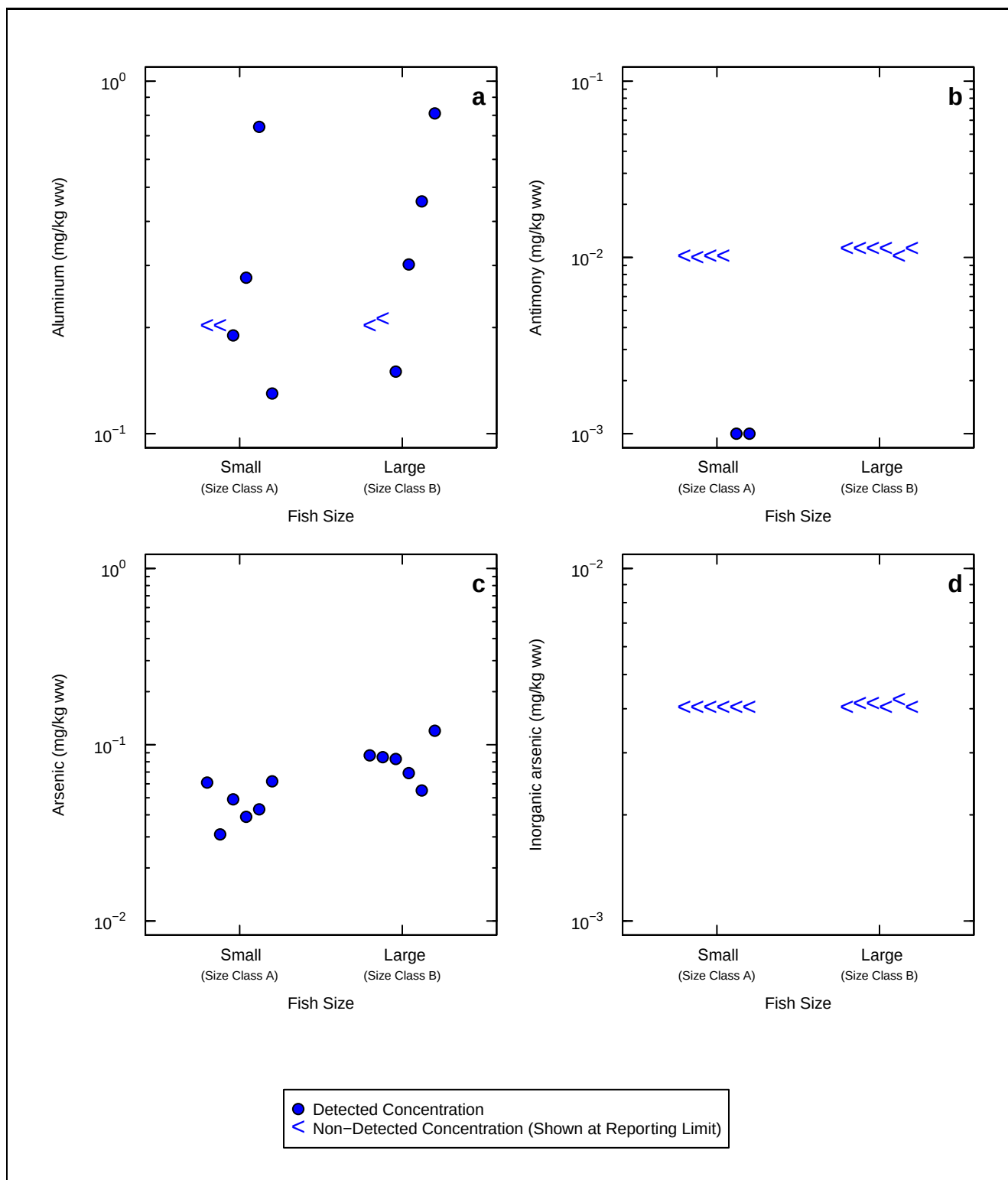


Figure 5-3a through d. Wet Weight Concentrations of Metals/Metalloids in Northern Pike Fillet Composites

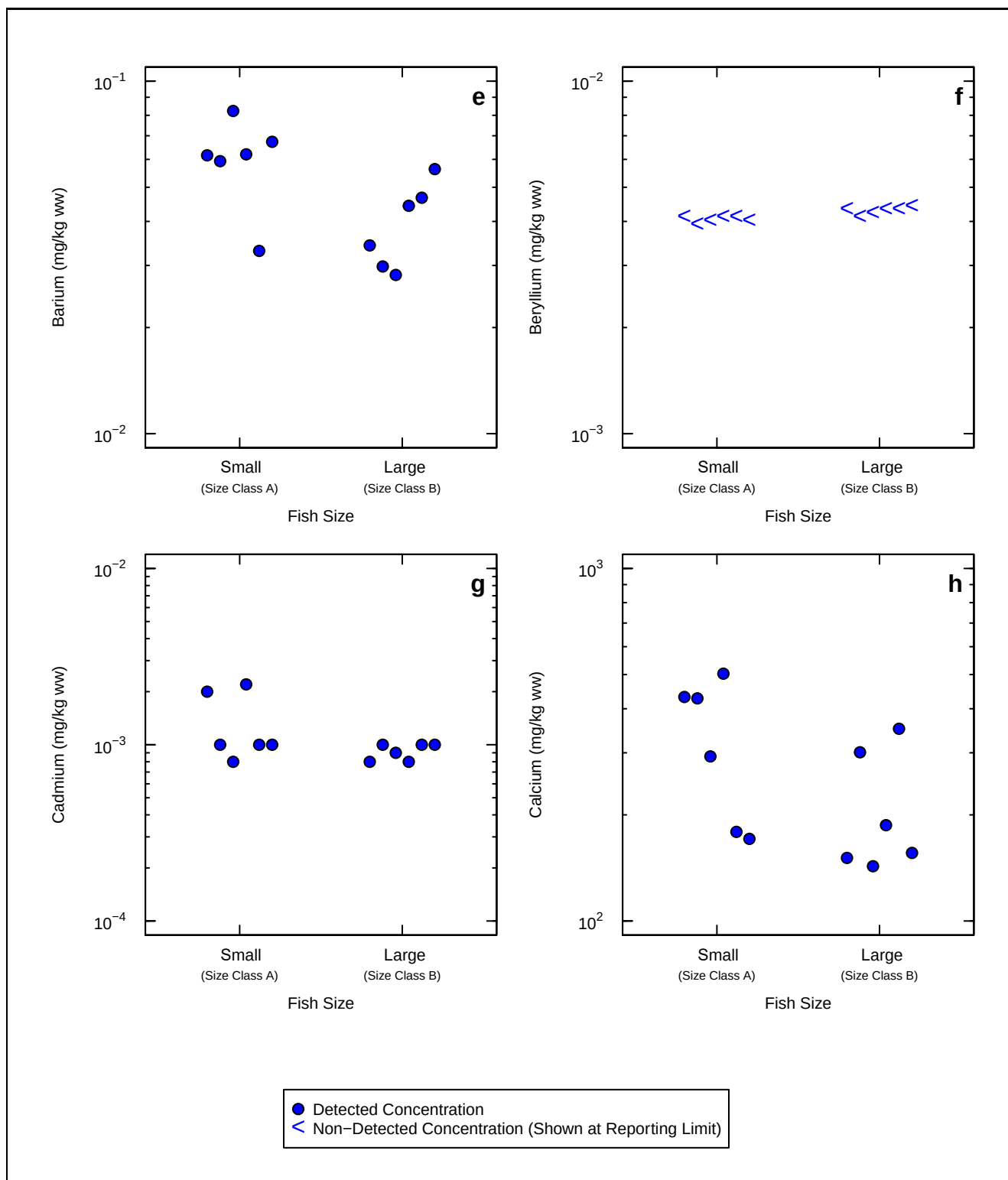


Figure 5-3e through h. Wet Weight Concentrations of Metals/Metalloids in Northern Pike Fillet Composites

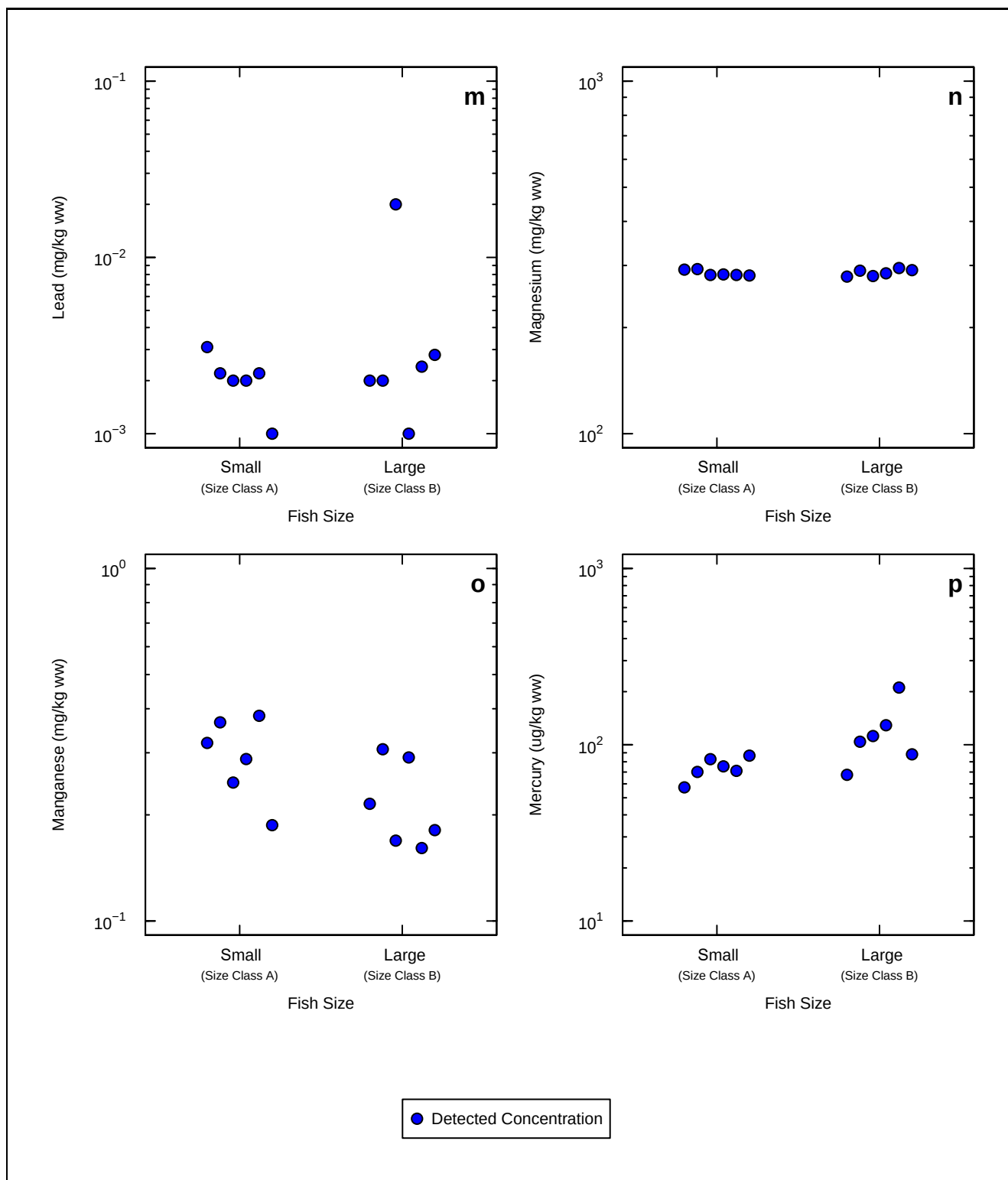


Figure 5–3m through p. Wet Weight Concentrations of Metals/Metalloids in Northern Pike Fillet Composites

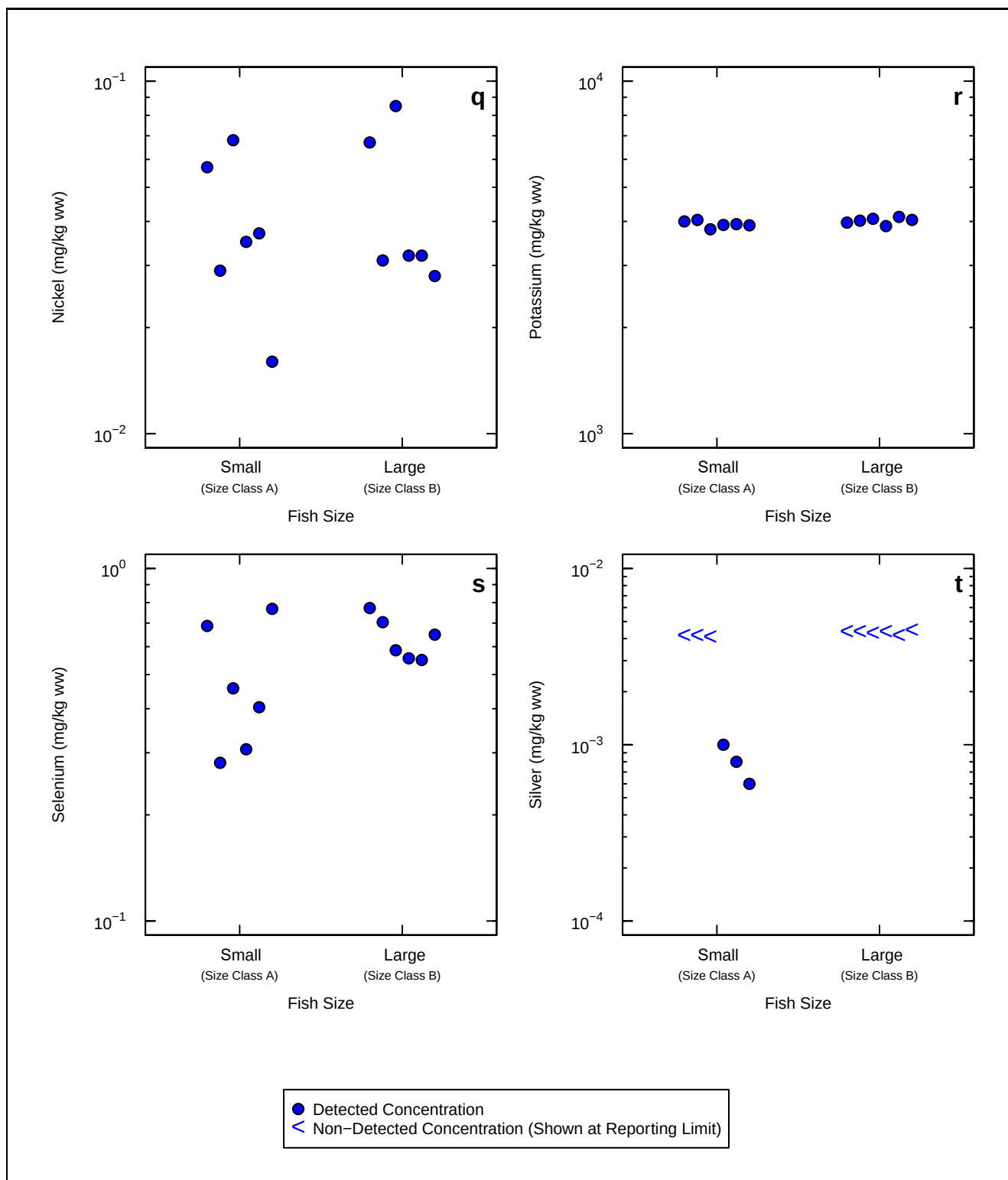


Figure 5-3q through t. Wet Weight Concentrations of Metals/Metalloids in Northern Pike Fillet Composites

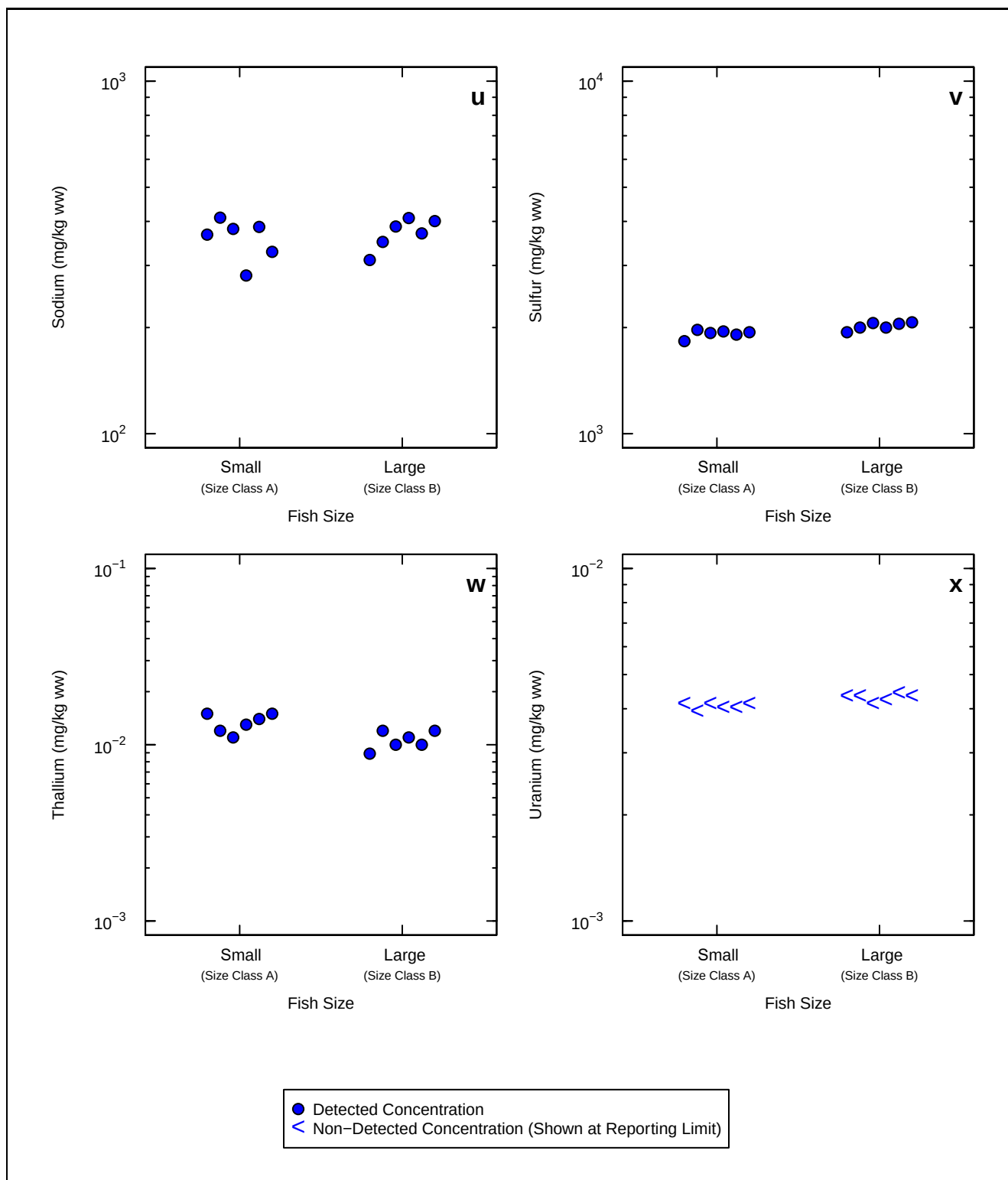


Figure 5-3u through x. Wet Weight Concentrations of Metals/Metalloids in Northern Pike Fillet Composites

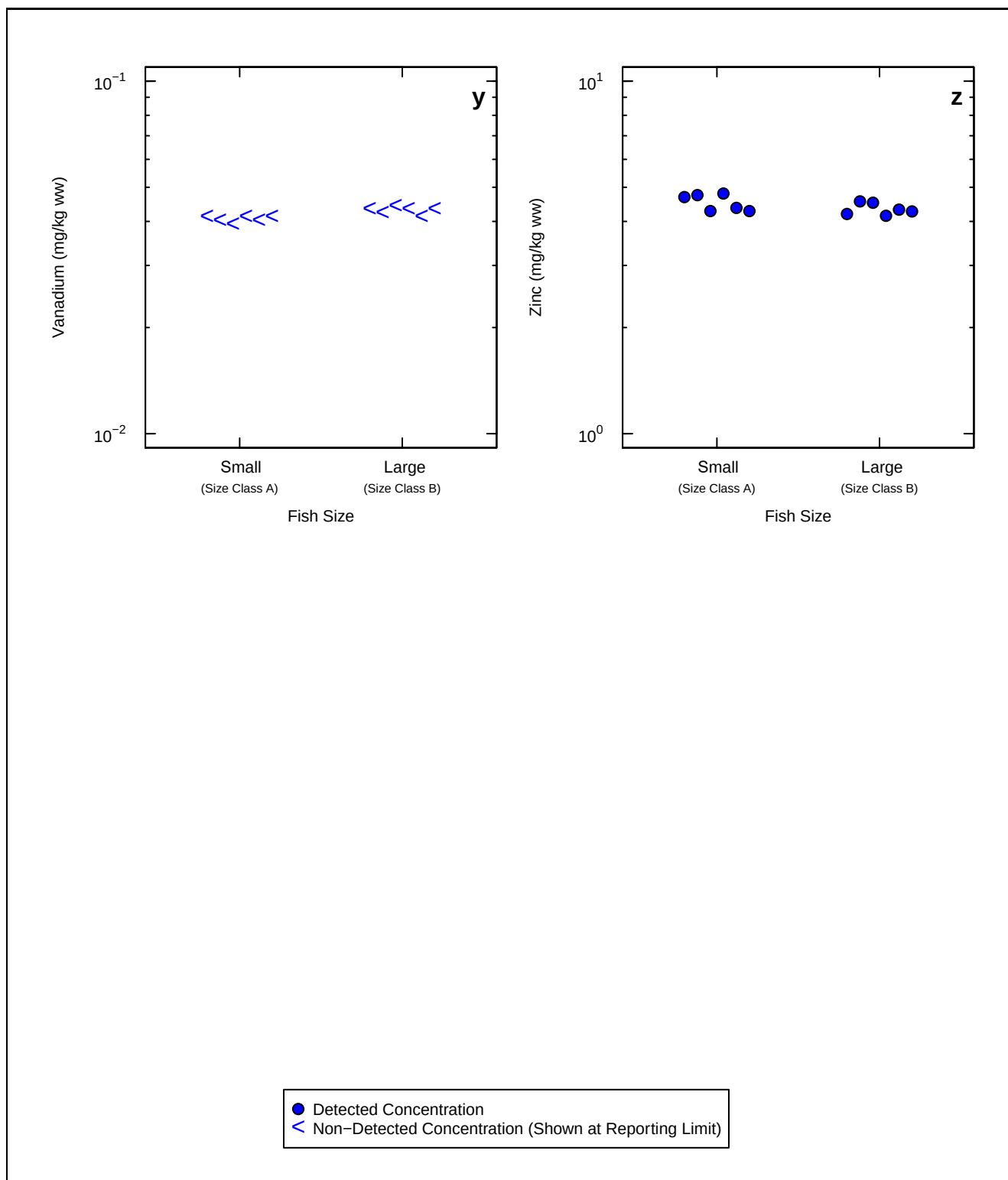
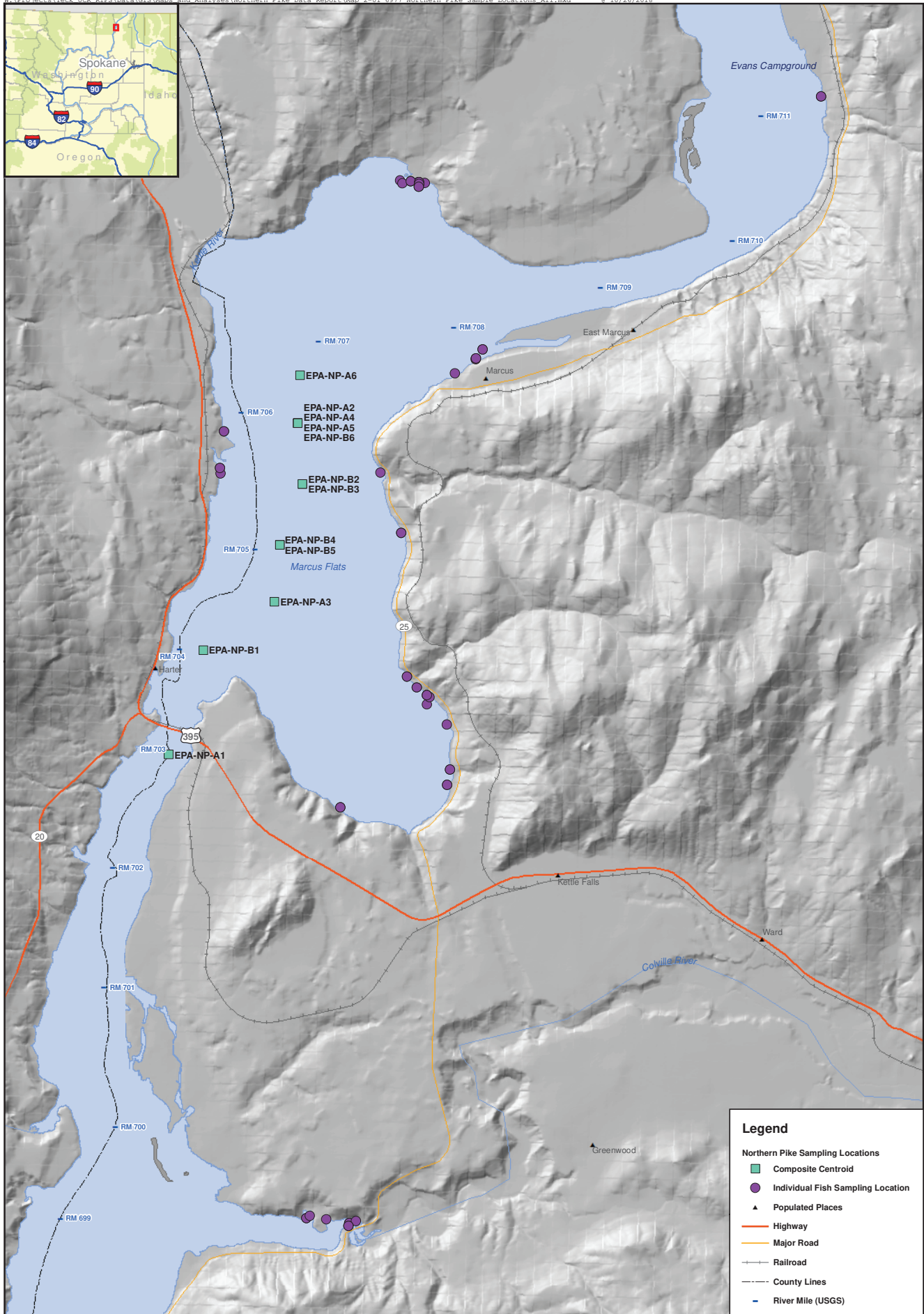
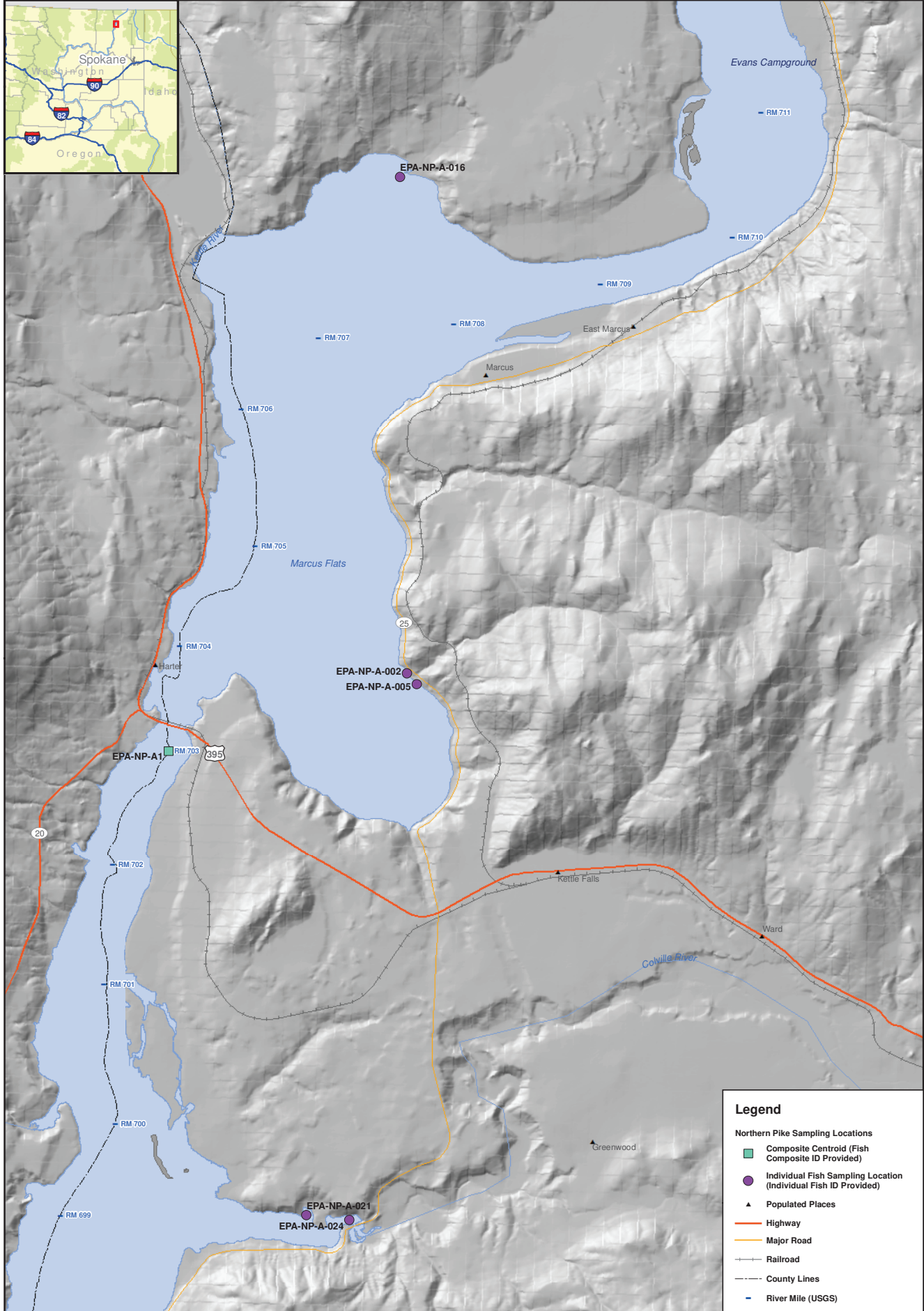
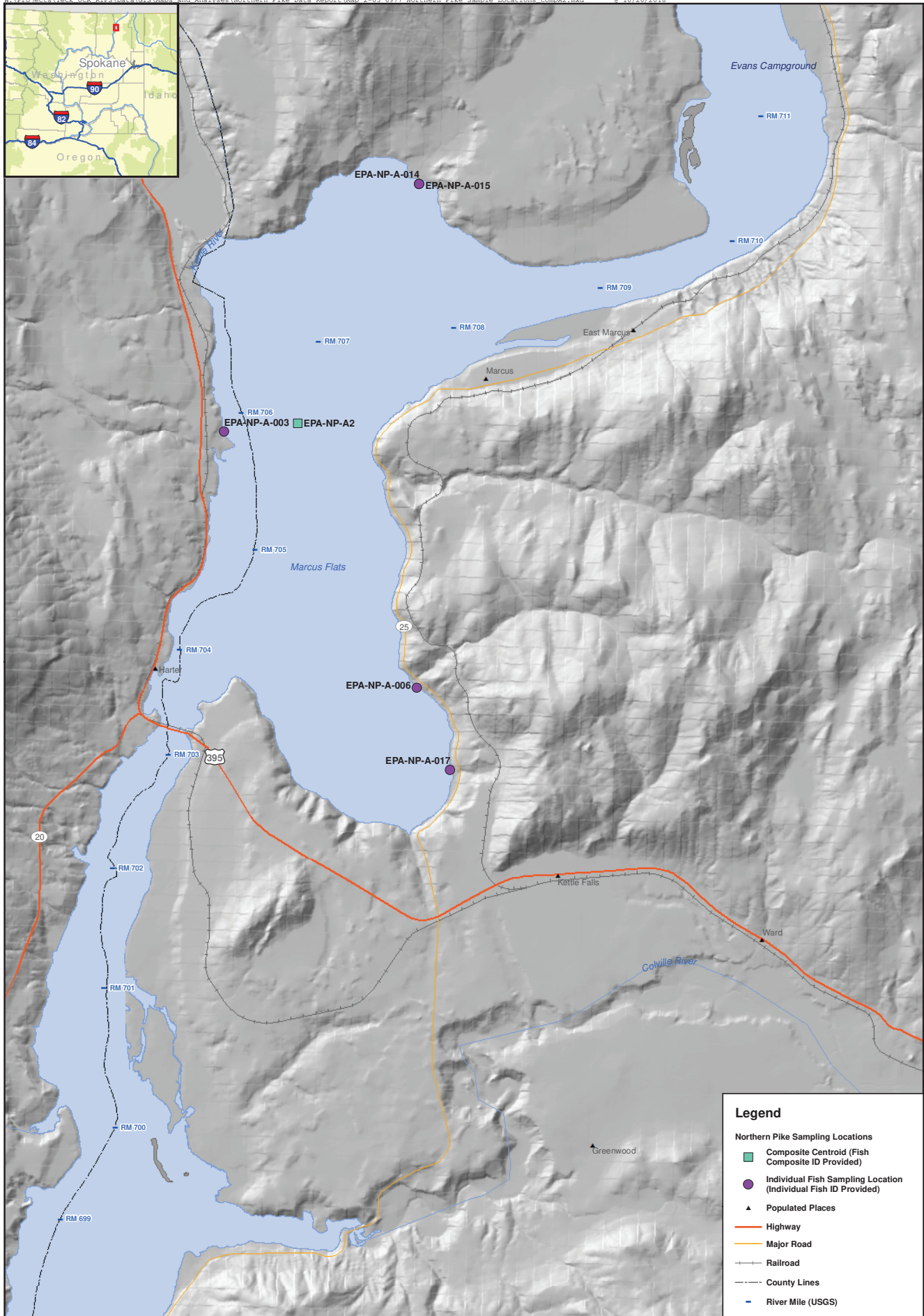


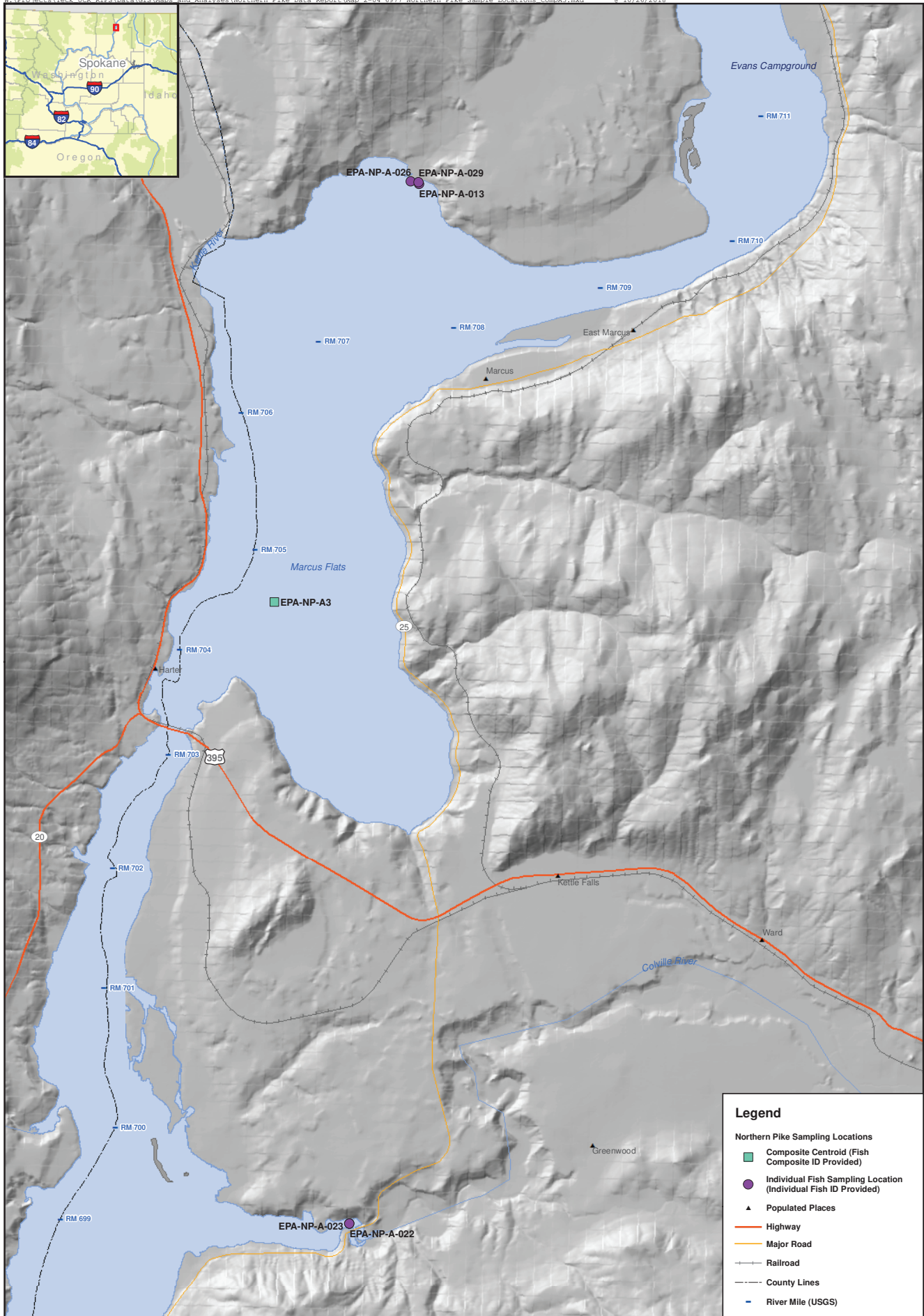
Figure 5-3y through z. Wet Weight Concentrations of Metals/Metalloids in Northern Pike Fillet Composites

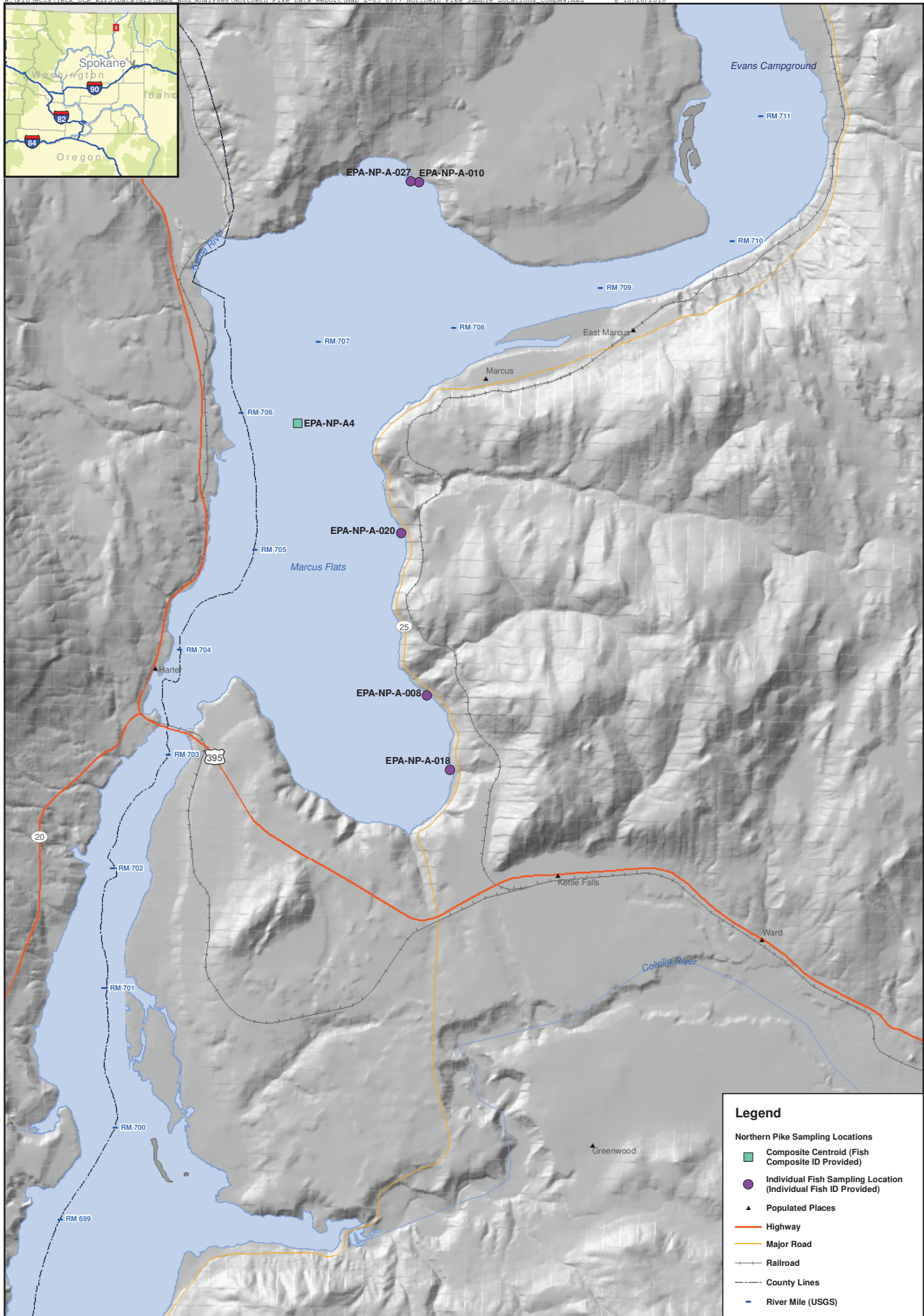
MAPS

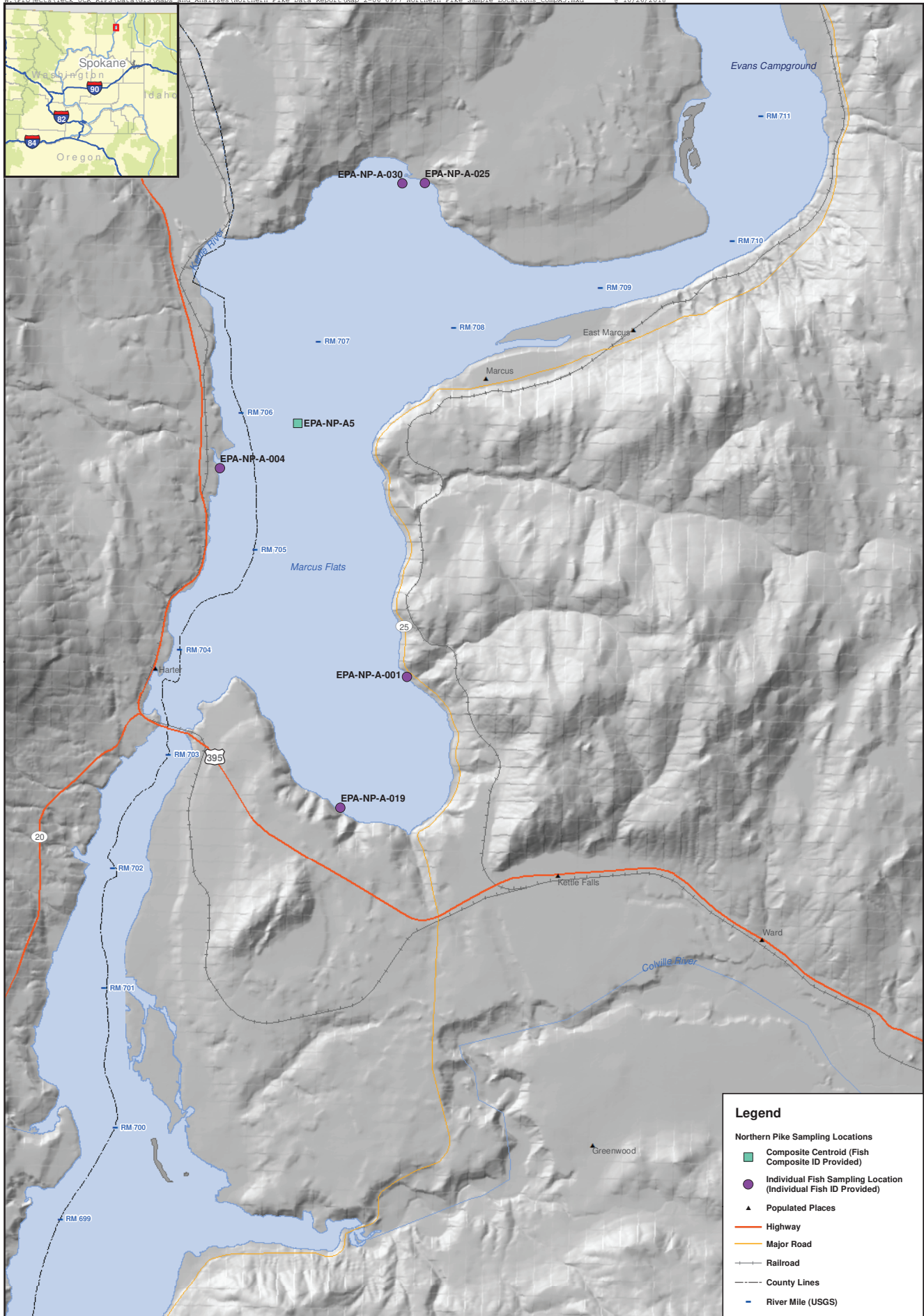


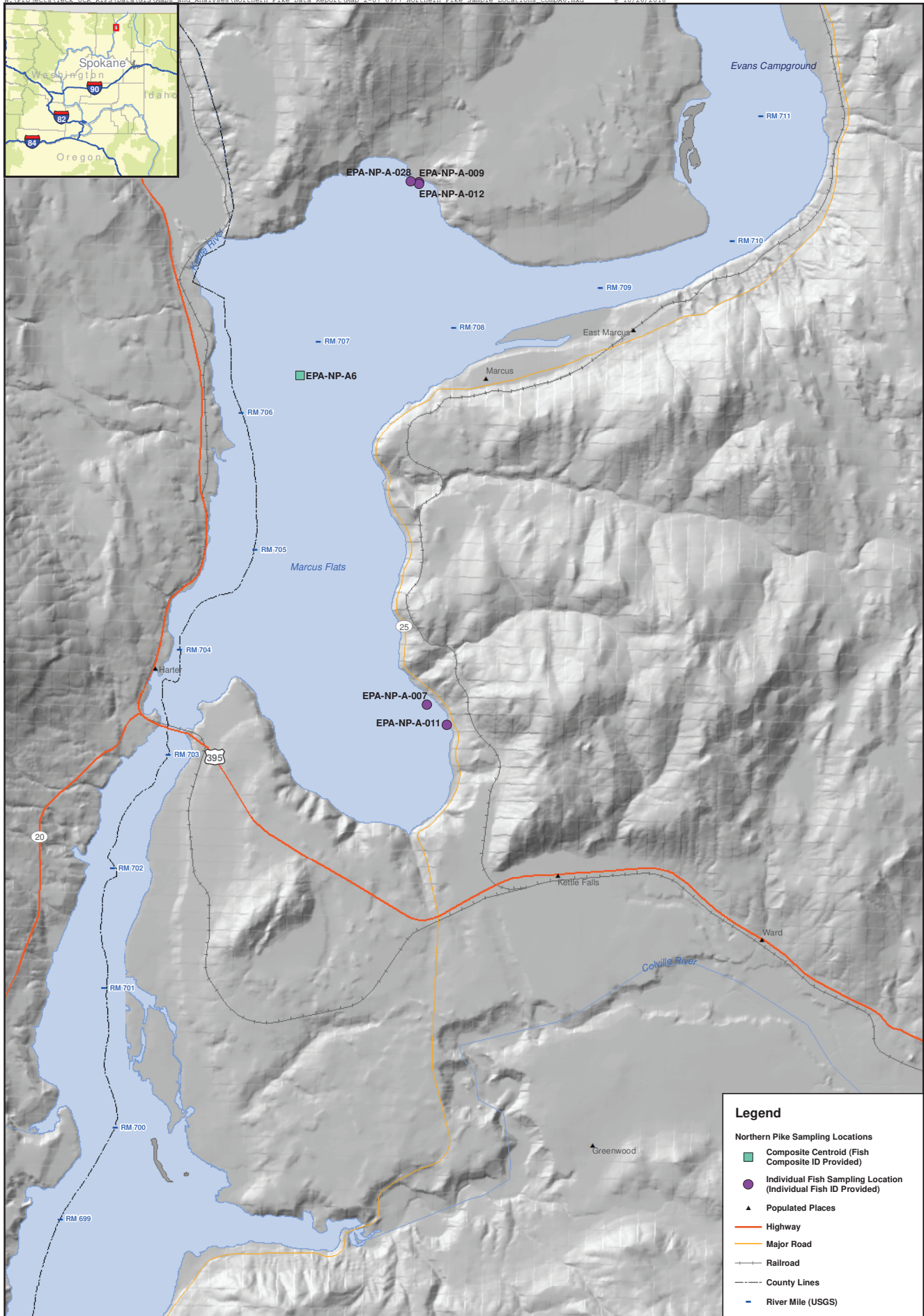


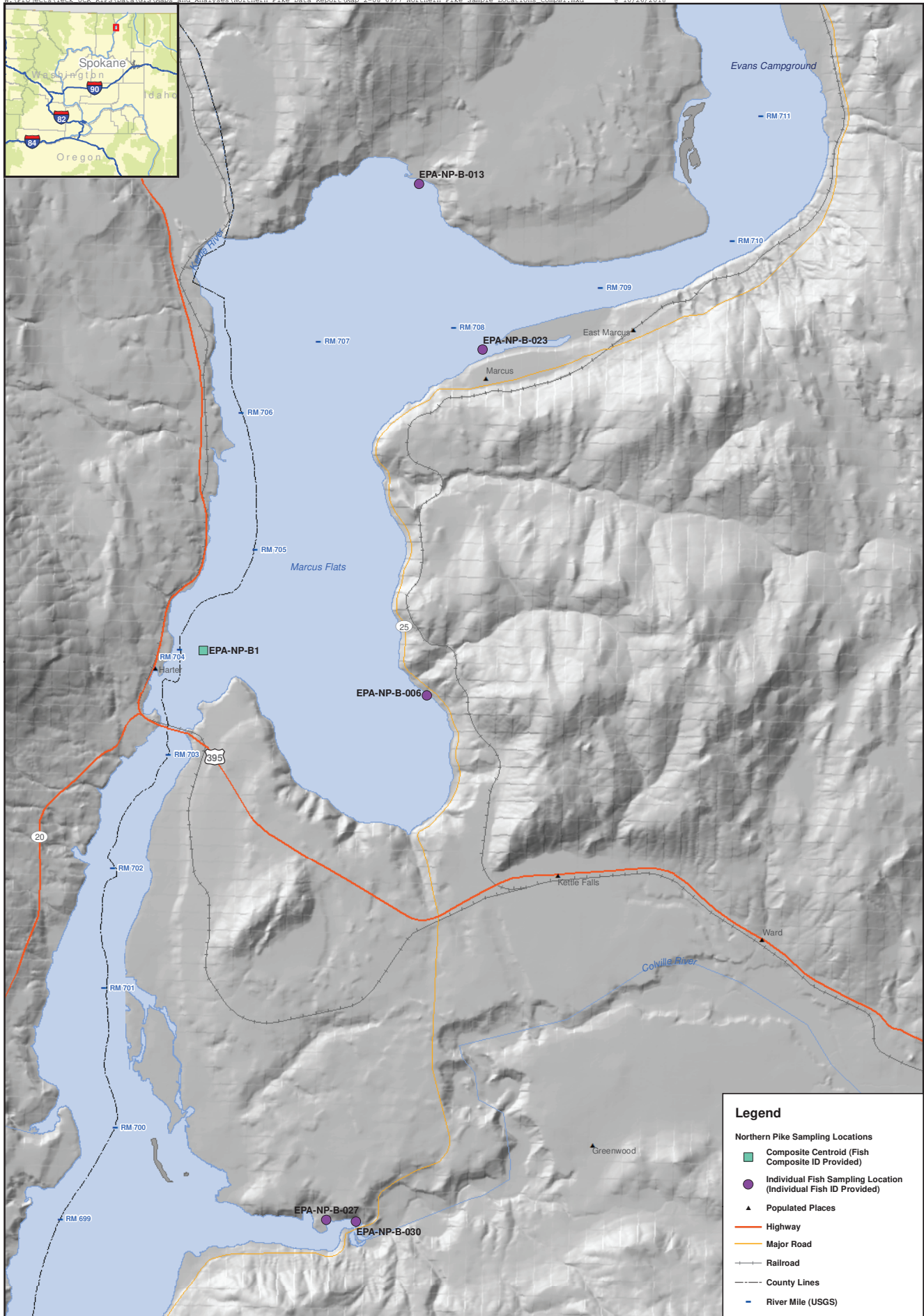


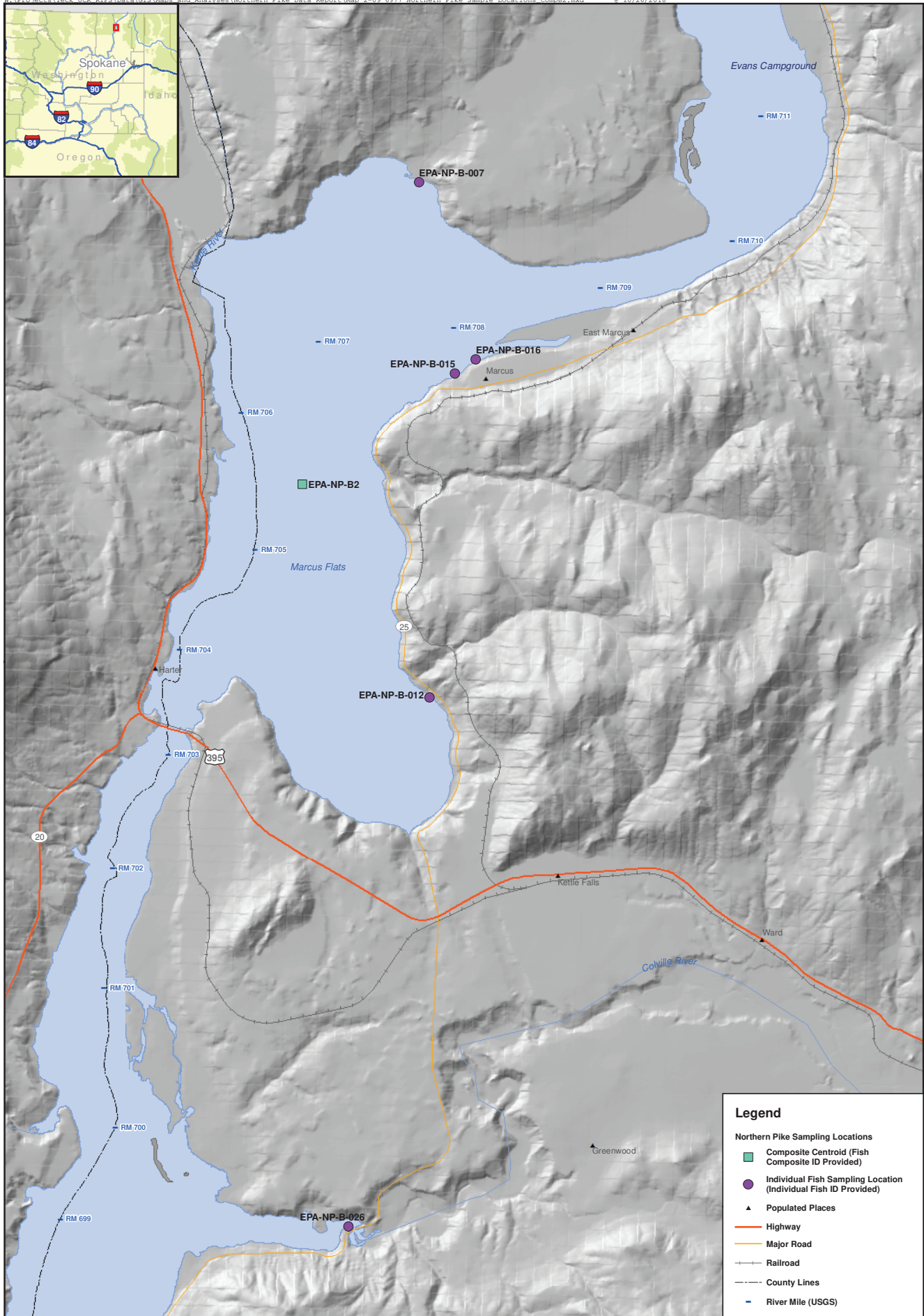


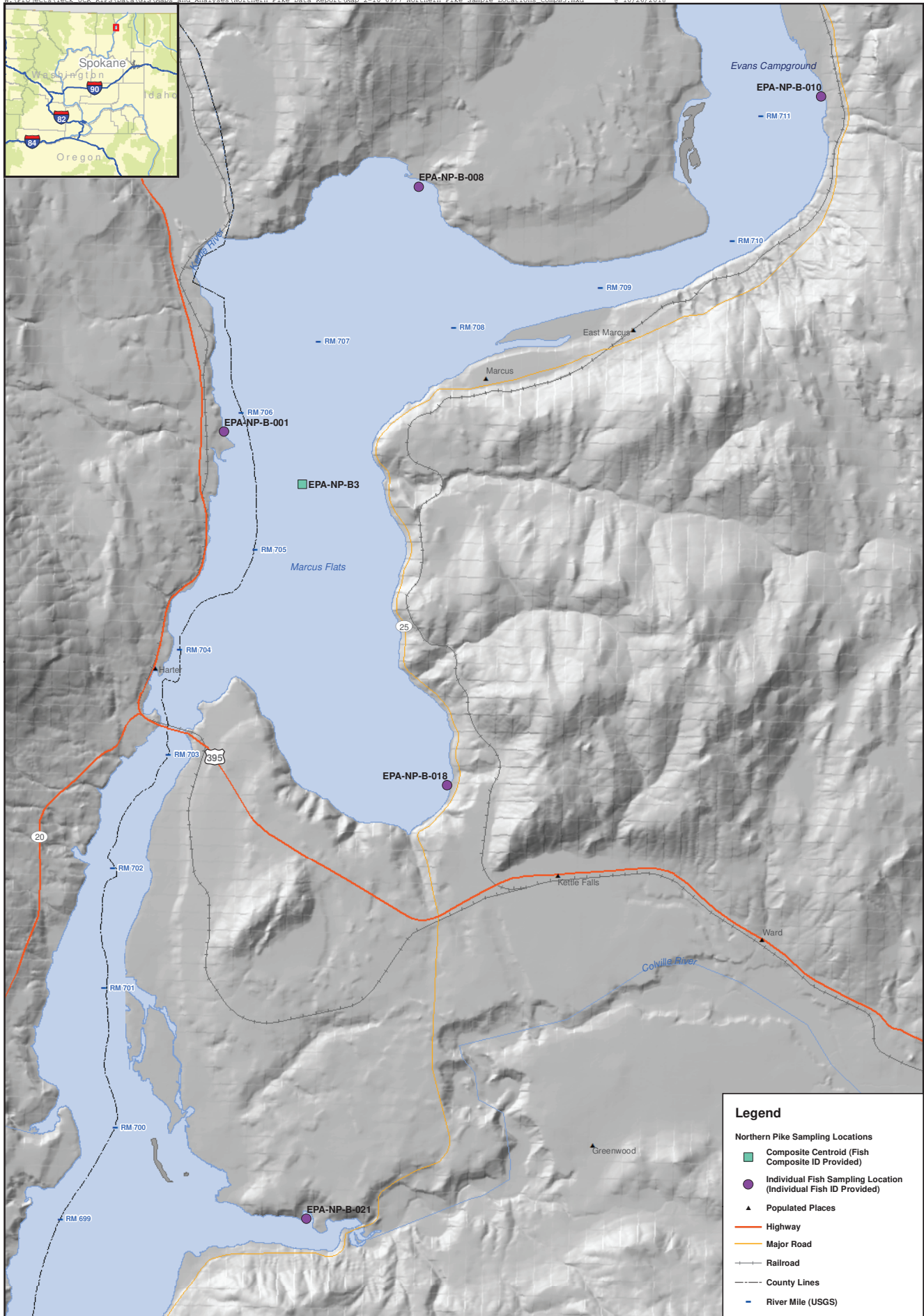


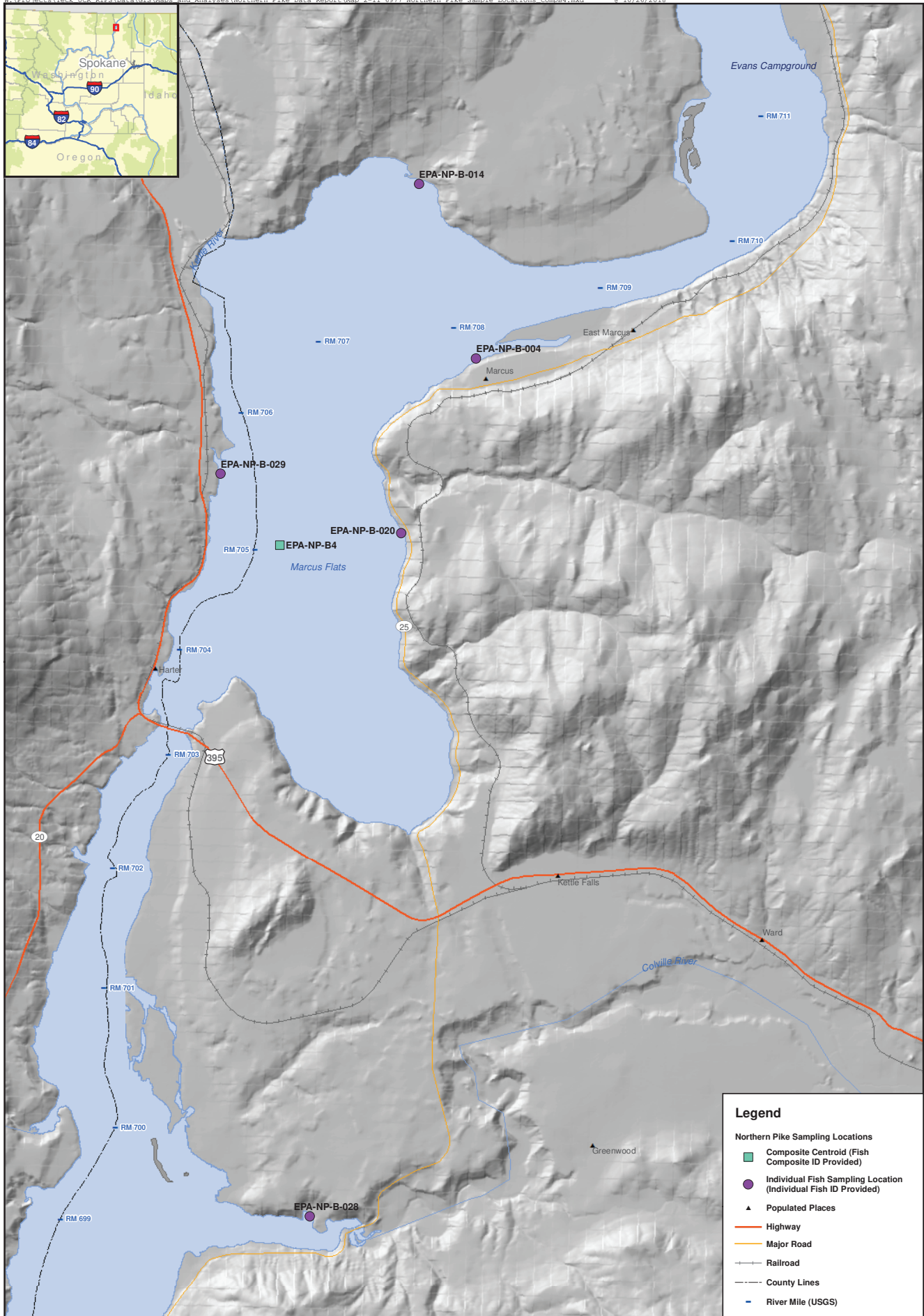


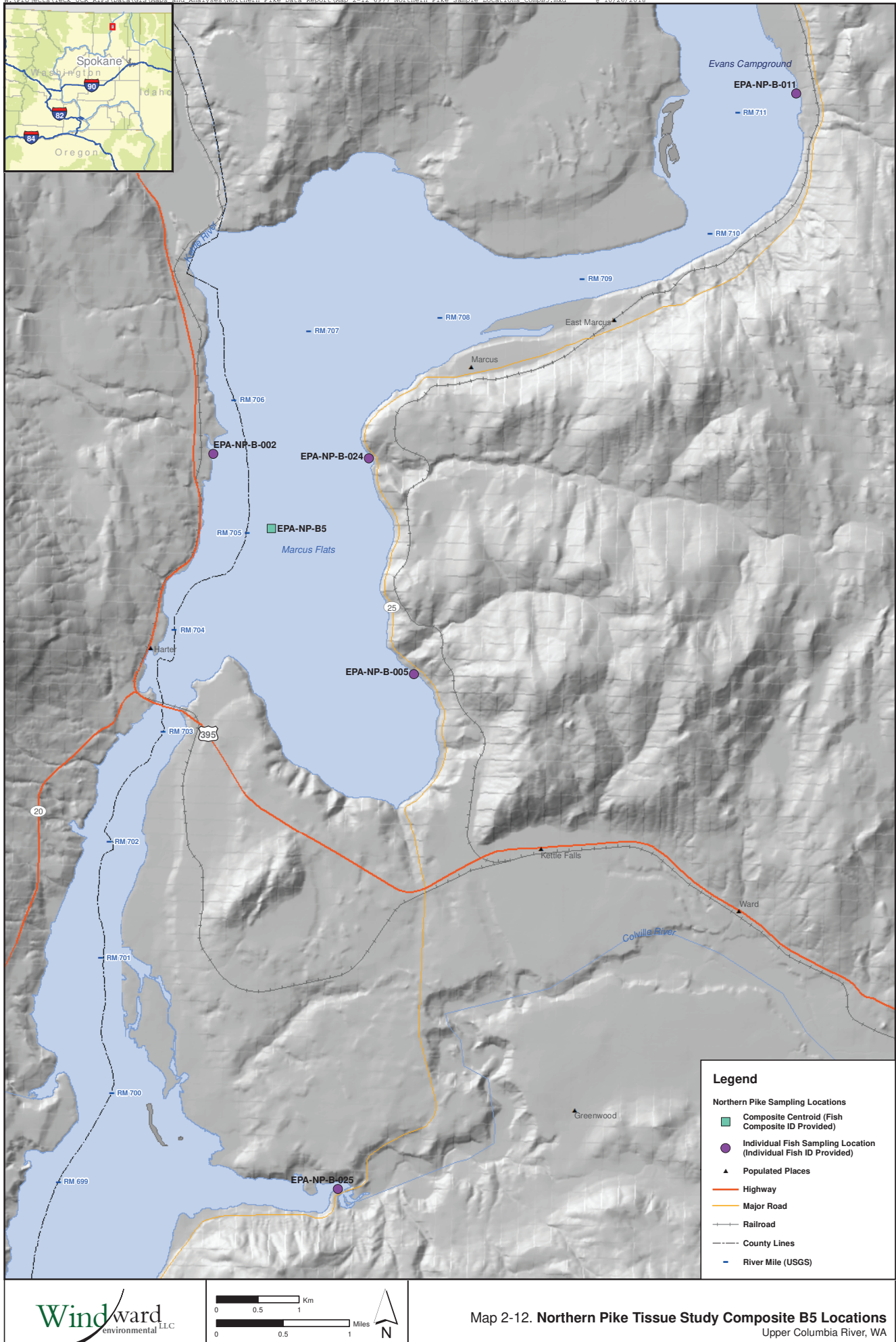


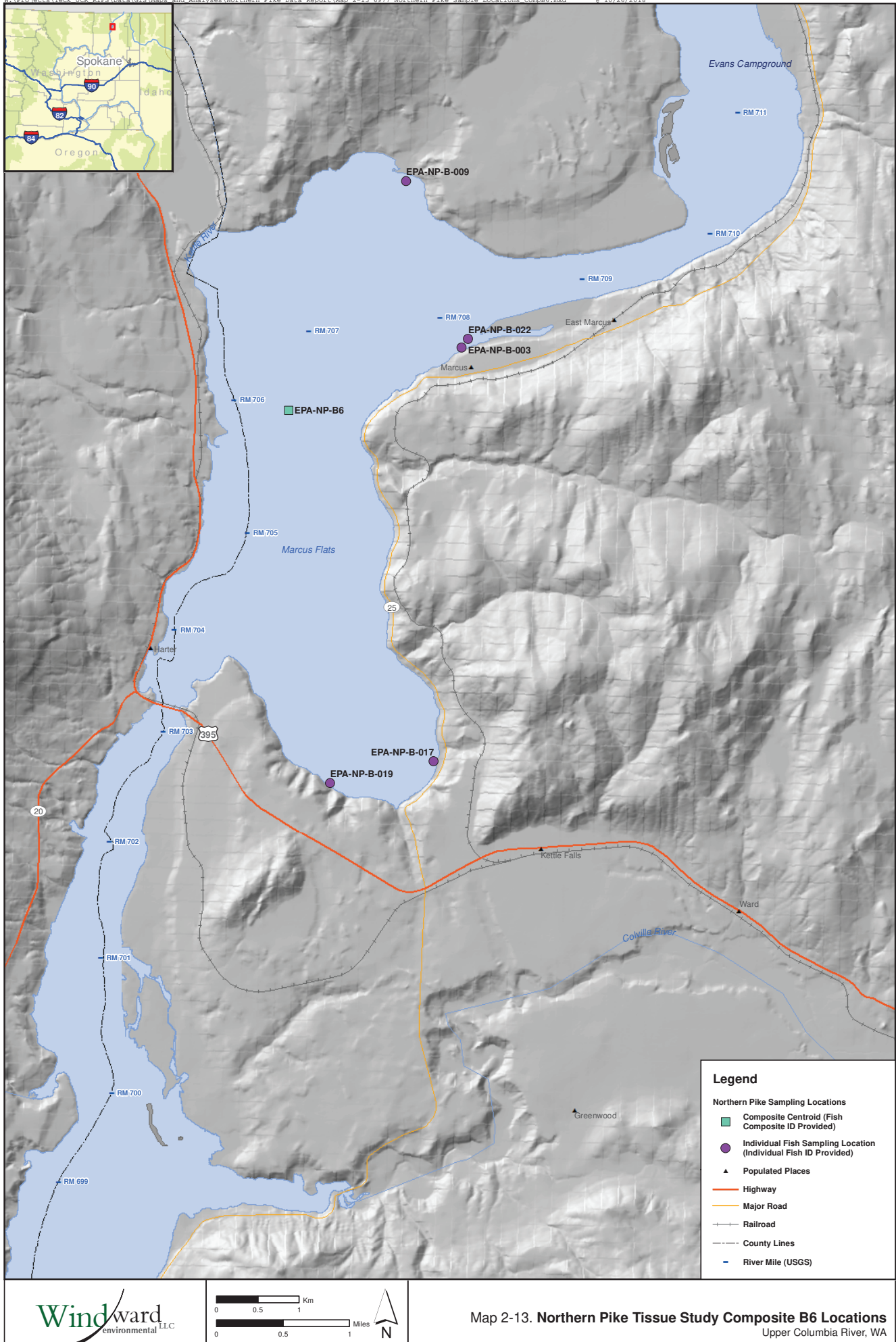












TABLES

Table 2-1. TAL MDLs and MRLs, and ACGs^a

Analyte	2018 RBC	MRL	MDL	2018 ACG
Conventional Parameters				
Total length	na	na	na	na
Total mass	na	na	na	na
Percent moisture ^b	na	0.1	na	0.1
Percent lipids	na	0.1	na	0.1
Metals/Metalloids (mg/kg dw)				
Aluminum	956	2	0.2	956
Antimony	0.382	0.05	0.002	0.382
Arsenic - total	0.0135	0.5	0.02	0.5
Arsenic - total inorganic	0.0135	0.02	0.007	0.02
Barium	191.2	0.05	0.005	191.2
Beryllium	1.912	0.02	0.003	1.912
Cadmium	0.956	0.02	0.002	0.956
Calcium	na	4	2	4
Chromium	0.0404	0.2	0.02	0.0404
Cobalt	0.2864	0.02	0.003	0.2864
Copper	38.2	0.1	0.02	38.2
Iron	668	1	0.2	668
Lead	na	0.02	0.0005	0.02
Magnesium	na	2	0.6	2
Manganese	133.6	0.05	0.008	133.6
Mercury	0.0956	0.001	0.00008	0.0956
Nickel	10.52	0.2	0.02	10.52
Potassium	na	20	9	20
Selenium	4.76	0.1	0.05	4.76
Silver	4.76	0.02	0.006	4.76
Sodium	na	20	2	20
Sulfur	na	8	4	8
Thallium	0.00956	0.02	0.0009	0.02
Uranium	0.1912	0.02	0.0008	0.1912
Vanadium	4.8	0.2	0.007	4.8
Zinc	286.4	0.5	0.06	286.4

Notes:

^a Risk-based concentrations (RBCs), method reporting limits (MRLs), method detection limits (MDLs), and analytical concentration goals (ACGs) were presented in Table A-2 of the QAPP addendum (CH2MHill and SRC 2018). EPA revised Table A-2 on November 21, 2018 to update some of the ACGs and RBCs (Tonel 2018). The values shown in this table are from revised Table A-2 of the Final QAPP.

^b Percent solids was measured by the laboratory and percent moisture was calculated from percent solids.

na - not available

TAL - target analyte list

Table 2-2. Methods for Analysis of COIs in Northern Pike Fillet Composites

Analyte	Analytical Method	Description
Aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, nickel, silver, thallium, uranium, vanadium, and zinc	EPA 6020B	ICP-MS
Calcium, magnesium, potassium, sodium, and sulfur	EPA 6010C	ICP-AES
Inorganic arsenic	EPA 1632A	HG-QFAAS
Mercury	EPA 1631E	CV-AFS
Selenium	EPA 7742	Hydride AA
Lipids	NA	Bligh-Dyer/gravimetric
Total solids ^a	NA	Freeze-dry/gravimetric

Notes:

^a Total solids was measured by the laboratory and total moisture was calculated from total solids.

AA - atomic absorption

COI - chemical of interest

CV-AFS - cold vapor-atomic fluorescence spectrometry

HG-QFAAS - hydride generation-quartz furnace atomic absorption spectrometry

ICP-AES - inductively coupled plasma-atomic emission spectrometry

ICP-MS - inductively coupled plasma-mass spectrometry

NA - not applicable

Table 4-1. Summary of Metals/Metalloid Data Qualifiers Applied to Rinsate and Homogenization Blank Data

Analyte	Number of Samples Analyzed	Rejected Results	Accepted Results	Count of Results with No Flags	Count of Accepted Results Laboratory Flags				Count of Accepted Results Validator Flags			Laboratory Flags, % of Accepted Results				Validator Flags, % of Accepted Results		
					J	J,x	U	U,x	J	U	UJ	J	J,x	U	U,x	J	U	UJ
Aluminum	21	0 (0%)	21 (100%)	0	4	0	17	0	4	17	0	19	0	81	0	19	81	0
Antimony	21	0 (0%)	21 (100%)	0	0	0	21	0	0	21	0	0	0	100	0	0	100	0
Arsenic	21	0 (0%)	21 (100%)	0	0	0	21	0	0	21	0	0	0	100	0	0	100	0
Barium	21	0 (0%)	21 (100%)	0	8	0	13	0	8	13	0	38	0	62	0	38	62	0
Beryllium	21	0 (0%)	21 (100%)	0	2	0	19	0	2	19	0	10	0	90	0	10	90	0
Cadmium	21	0 (0%)	21 (100%)	0	0	0	21	0	0	21	0	0	0	100	0	0	100	0
Calcium	21	0 (0%)	21 (100%)	2	19	0	0	0	19	0	0	90	0	0	0	90	0	0
Chromium	21	0 (0%)	21 (100%)	0	2	0	19	0	2	19	0	10	0	90	0	10	90	0
Cobalt	21	0 (0%)	21 (100%)	0	0	0	21	0	0	21	0	0	0	100	0	0	100	0
Copper	21	0 (0%)	21 (100%)	8	11	0	2	0	11	2	0	52	0	10	0	52	10	0
Inorganic arsenic	21	0 (0%)	21 (100%)	0	0	1	18	2	1	20	0	0	5	86	10	5	95	0
Iron	21	0 (0%)	21 (100%)	0	16	0	5	0	16	2	3	76	0	24	0	76	10	14
Lead	21	0 (0%)	21 (100%)	1	9	0	11	0	9	11	0	43	0	52	0	43	52	0
Magnesium	21	0 (0%)	21 (100%)	0	20	0	1	0	20	0	1	95	0	5	0	95	0	5
Manganese	21	0 (0%)	21 (100%)	0	8	0	13	0	8	4	9	38	0	62	0	38	19	43
Mercury	21	0 (0%)	21 (100%)	0	20	0	1	0	20	1	0	95	0	5	0	95	5	0
Nickel	21	0 (0%)	21 (100%)	1	2	0	18	0	2	18	0	10	0	86	0	10	86	0
Potassium	21	0 (0%)	21 (100%)	0	0	0	21	0	0	21	0	0	0	100	0	0	100	0
Selenium	21	0 (0%)	21 (100%)	0	0	0	21	0	0	21	0	0	0	100	0	0	100	0
Silver	21	0 (0%)	21 (100%)	0	2	0	19	0	2	19	0	10	0	90	0	10	90	0
Sodium	21	0 (0%)	21 (100%)	0	2	0	19	0	2	19	0	10	0	90	0	10	90	0
Sulfur	21	0 (0%)	21 (100%)	0	1	0	20	0	1	3	17	5	0	95	0	5	14	81
Thallium	21	0 (0%)	21 (100%)	3	1	0	17	0	1	17	0	5	0	81	0	5	81	0
Uranium	21	0 (0%)	21 (100%)	0	0	0	21	0	0	21	0	0	0	100	0	0	100	0
Vanadium	21	0 (0%)	21 (100%)	0	0	0	21	0	0	21	0	0	0	100	0	0	100	0
Zinc	21	0 (0%)	21 (100%)	10	9	0	2	0	9	2	0	43	0	10	0	43	10	0

Notes:

Data qualifiers

Laboratory

- J The result is an estimated value.
J, x The result is an estimated value. The laboratory report case narrative contained additional information about this result.
U The analyte was analyzed for, but was not detected at or above the method reporting limit/method detection limit (MRL/MDL).
U, x The analyte was analyzed for, but was not detected at or above the MRL/MDL. The laboratory report case narrative contained additional information about this result.

Validator

- J Quantitation is approximate due to limitations identified during the QA review (data validation).
U This analyte was not detected at or above the associated detection limit.
UJ This analyte was not detected at or above the associated detection limit. Quantitation is approximate due to limitations identified during the QA review (data validation).

Table 4-2. Summary of Data Qualifiers Applied to Fillet Composite Data

Analyte	Number of Samples Analyzed	Rejected Results	Accepted Results	Count of Results with No Flags	Count of Accepted Results Laboratory Flags		Count of Accepted Results Validator Flags					Laboratory Flags, % of Accepted Results		Validator Flags, % of Accepted Results				
					J	U	J	J-	U	U*	UJ	J	U	J	J-	U	U*	UJ
Metals/Metalloids																		
Aluminum	12	0 (0%)	12 (100%)	5	3	4	3	0	4	0	0	25	33	25	0	33	0	0
Antimony	12	0 (0%)	12 (100%)	0	2	10	2	0	10	0	0	17	83	17	0	83	0	0
Arsenic	12	0 (0%)	12 (100%)	1	11	0	11	0	0	0	0	92	0	92	0	0	0	0
Barium	12	0 (0%)	12 (100%)	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Beryllium	12	0 (0%)	12 (100%)	0	0	12	0	0	12	0	0	0	100	0	0	100	0	0
Cadmium	12	0 (0%)	12 (100%)	0	12	0	12	0	0	0	0	100	0	100	0	0	0	0
Calcium	12	0 (0%)	12 (100%)	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chromium	12	0 (0%)	12 (100%)	11	1	0	1	0	0	0	0	8	0	8	0	0	0	0
Cobalt	12	0 (0%)	12 (100%)	5	7	0	7	0	0	0	0	58	0	58	0	0	0	0
Copper	12	0 (0%)	12 (100%)	0	0	0	12	0	0	0	0	0	0	100	0	0	0	0
Inorganic arsenic	12	0 (0%)	12 (100%)	0	0	12	0	0	0	0	12	0	100	0	0	0	0	100
Iron	12	0 (0%)	12 (100%)	9	0	0	0	0	0	3	0	0	0	0	0	0	25	0
Lead	12	0 (0%)	12 (100%)	1	11	0	11	0	0	0	0	92	0	92	0	0	0	0
Magnesium	12	0 (0%)	12 (100%)	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manganese	12	0 (0%)	12 (100%)	0	0	0	12	0	0	0	0	0	0	100	0	0	0	0
Mercury	12	0 (0%)	12 (100%)	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nickel	12	0 (0%)	12 (100%)	4	8	0	8	0	0	0	0	67	0	67	0	0	0	0
Potassium	12	0 (0%)	12 (100%)	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Selenium	12	0 (0%)	12 (100%)	0	0	0	0	12	0	0	0	0	0	0	100	0	0	0
Silver	12	0 (0%)	12 (100%)	0	3	9	3	0	9	0	0	25	75	25	0	75	0	0
Sodium	12	0 (0%)	12 (100%)	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sulfur	12	0 (0%)	12 (100%)	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thallium	12	0 (0%)	12 (100%)	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Uranium	12	0 (0%)	12 (100%)	0	0	12	0	0	12	0	0	0	100	0	0	100	0	0
Vanadium	12	0 (0%)	12 (100%)	0	0	12	0	0	12	0	0	0	100	0	0	100	0	0
Zinc	12	0 (0%)	12 (100%)	0	0	0	12	0	0	0	0	0	0	100	0	0	0	0
Conventional Parameters																		
Lipid	12	0 (0%)	12 (100%)	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total moisture	12	0 (0%)	12 (100%)	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total solids	12	0 (0%)	12 (100%)	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Notes:

Data qualifiers

Laboratory

J The result is an estimated value.
U The analyte was analyzed for, but was not detected at or above the method reporting limit/method detection limit (MRL/MDL).

Validator

J Quantitation is approximate due to limitations identified during the QA review (data validation).
J- Quantitation is approximate and the result may be biased low.
U This analyte was not detected at or above the associated detection limit.
U* This analyte should be considered nondetected because it was detected in an associated blank at a similar level.
UJ This analyte was not detected at or above the associated detection limit. Quantitation is approximate due to limitations identified during the QA review (data validation).

Table 4-3. Summary of Metal Detections in Homogenization and Rinsate Blanks^{a,b}

Analyte	Homogenization Blanks			Rinsate Blanks		
	Number of Samples	Number of Detects	Detection Frequency (%)	Number of Samples	Number of Detects	Detection Frequency (%)
Aluminum	14	4	29	7	0	0
Antimony	14	0	0	7	0	0
Arsenic	14	0	0	7	0	0
Barium	14	5	36	7	3	43
Beryllium	14	1	7	7	1	14
Cadmium	14	0	0	7	0	0
Calcium	14	14	100	7	7	100
Chromium	14	2	14	7	0	0
Cobalt	14	0	0	7	0	0
Copper	14	13	93	7	6	86
Inorganic arsenic	14	0	0	7	1	14
Iron	14	11	79	7	5	71
Lead	14	6	43	7	4	57
Magnesium	14	13	93	7	7	100
Manganese	14	5	36	7	3	43
Mercury	14	14	100	7	6	86
Nickel	14	2	14	7	1	14
Potassium	14	0	0	7	0	0
Selenium	14	0	0	7	0	0
Silver	14	1	7	7	1	14
Sodium	14	1	7	7	1	14
Sulfur	14	0	0	7	1	14
Thallium	14	2	14	7	2	29
Uranium	14	0	0	7	0	0
Vanadium	14	0	0	7	0	0
Zinc	14	13	93	7	6	86

Notes:

^a All homogenization and rinsate blanks had multiple detected metals.

^b Approximately 30 percent of the homogenization and rinsate blank results were detected values. Of the detected results, 84 percent were between the detection limit and the reporting limit (RL); of the metals detected in the blanks above the RL, most were only slightly above, with the exception of zinc in one rinsate blank.

Table 5-1. Summary of Results for Fillet Composites from Small Fish (Size Class A, 300 to 449 mm)

Analyte	Count of Results			All Sample Results				Detected Results Only			
	Total No.	No. of Detected Values	% Detected	Min	Mean	Max	SD	Min	Mean	Max	SD
Metals/Metalloids (mg/kg dw except mercury)											
Aluminum	6	4	67	0.5	1.3	3.6	1.2	0.62	1.6	3.6	1.3
Antimony	6	2	33	0.005	0.018	0.025	0.01	0.005	0.005	0.005	0
Arsenic	6	6	100	0.15	0.24	0.31	0.062	0.15	0.24	0.31	0.062
Barium	6	6	100	0.16	0.302	0.422	0.0847	0.16	0.302	0.422	0.0847
Beryllium	6	0	0	0.01	0.01	0.01	1.2E-10	NA	NA	NA	NA
Cadmium	6	6	100	0.004	0.007	0.011	0.0029	0.004	0.007	0.011	0.0029
Calcium	6	6	100	829	1660	2580	725	829	1660	2580	725
Chromium	6	6	100	0.18	0.43	0.77	0.21	0.18	0.43	0.77	0.21
Cobalt	6	6	100	0.016	0.019	0.023	0.003	0.016	0.019	0.023	0.003
Copper	6	6	100	1.06	1.77	2.51	0.525	1.06	1.77	2.51	0.525
Inorganic arsenic	6	0	0	0.01	0.01	0.01	1.2E-10	NA	NA	NA	NA
Iron	6	5	83	4.75	19	35.6	12	10.3	21.5	35.6	10.9
Lead	6	6	100	0.007	0.011	0.016	0.0031	0.007	0.011	0.016	0.0031
Magnesium	6	6	100	1370	1410	1450	37.1	1370	1410	1450	37.1
Manganese	6	6	100	0.909	1.48	1.96	0.385	0.909	1.48	1.96	0.385
Mercury (µg/kg dw)	6	6	100	294	365	425	46.5	294	365	425	46.5
Nickel	6	6	100	0.08	0.2	0.35	0.098	0.08	0.2	0.35	0.098
Potassium	6	6	100	19000	19400	20000	361	19000	19400	20000	361
Selenium	6	6	100	1.44	2.39	3.73	0.969	1.44	2.39	3.73	0.969
Silver	6	3	50	0.003	0.007	0.01	0.0033	0.003	0.004	0.005	0.001
Sodium	6	6	100	1400	1780	2030	240	1400	1780	2030	240
Sulfur	6	6	100	9360	9490	9570	72.4	9360	9490	9570	72.4
Thallium	6	6	100	0.054	0.066	0.075	0.0087	0.054	0.066	0.075	0.0087
Uranium	6	0	0	0.01	0.01	0.01	1.2E-10	NA	NA	NA	NA
Vanadium	6	0	0	0.1	0.1	0.1	1.9E-09	NA	NA	NA	NA
Zinc	6	6	100	20.8	22.4	24.6	1.52	20.8	22.4	24.6	1.52
Conventional Parameters (% ww)											
Lipid	6	6	100	0.25	0.4	0.49	0.11	0.25	0.4	0.49	0.11
Total moisture	6	6	100	79.4	79.8	80.5	0.413	79.4	79.8	80.5	0.413
Total solids	6	6	100	19.5	20.2	20.6	0.413	19.5	20.2	20.6	0.413

Notes:

Summary statistics were calculated using half the reporting limit for nondetected results.

NA - not applicable

SD - standard deviation

Table 5-2. Summary of Results for Fillet Composites from Large Fish (Size Class B, ≥ 450 mm)

Analyte	Count of Results			All Sample Results				Detected Results Only			
	Total No.	No. of Detected Values	% Detected	Min	Mean	Max	SD	Min	Mean	Max	SD
Metals/Metalloids (mg/kg dw except mercury)											
Aluminum	6	4	67	0.495	1.5	3.7	1.3	0.7	2	3.7	1.3
Antimony	6	0	0	0.025	0.025	0.025	4.8E-10	NA	NA	NA	NA
Arsenic	6	6	100	0.25	0.39	0.56	0.1	0.25	0.39	0.56	0.1
Barium	6	6	100	0.133	0.187	0.257	0.0486	0.133	0.187	0.257	0.0486
Beryllium	6	0	0	0.01	0.01	0.01	1.2E-10	NA	NA	NA	NA
Cadmium	6	6	100	0.004	0.0048	0.006	0.00098	0.004	0.0048	0.006	0.00098
Calcium	6	6	100	671	1010	1640	412	671	1010	1640	412
Chromium	6	6	100	0.26	0.45	0.83	0.24	0.26	0.45	0.83	0.24
Cobalt	6	6	100	0.014	0.018	0.025	0.0044	0.014	0.018	0.025	0.0044
Copper	6	6	100	0.95	1.2	1.73	0.28	0.95	1.2	1.73	0.28
Inorganic arsenic	6	0	0	0.0095	0.0098	0.01	0.00027	NA	NA	NA	NA
Iron	6	4	67	4.7	10	14.8	4.6	11.3	13.1	14.8	1.99
Lead	6	6	100	0.007	0.023	0.092	0.034	0.007	0.023	0.092	0.034
Magnesium	6	6	100	1320	1350	1380	20.7	1320	1350	1380	20.7
Manganese	6	6	100	0.756	1.03	1.43	0.297	0.756	1.03	1.43	0.297
Mercury ($\mu\text{g/kg dw}$)	6	6	100	326	553	964	223	326	553	964	223
Nickel	6	6	100	0.13	0.22	0.4	0.11	0.13	0.22	0.4	0.11
Potassium	6	6	100	18300	18800	19200	320	18300	18800	19200	320
Selenium	6	6	100	2.51	2.99	3.59	0.44	2.51	2.99	3.59	0.44
Silver	6	0	0	0.01	0.01	0.01	1.2E-10	NA	NA	NA	NA
Sodium	6	6	100	1500	1740	1920	148	1500	1740	1920	148
Sulfur	6	6	100	9280	9460	9650	140	9280	9460	9650	140
Thallium	6	6	100	0.043	0.05	0.058	0.0053	0.043	0.05	0.058	0.0053
Uranium	6	0	0	0.01	0.01	0.01	1.2E-10	NA	NA	NA	NA
Vanadium	6	0	0	0.1	0.1	0.1	1.9E-09	NA	NA	NA	NA
Zinc	6	6	100	19.5	20.3	21.3	0.745	19.5	20.3	21.3	0.745
Conventional Parameters (% ww)											
Lipid	6	6	100	0.35	0.53	0.66	0.13	0.35	0.53	0.66	0.13
Total moisture	6	6	100	78.1	78.7	79.3	0.393	78.1	78.7	79.3	0.393
Total solids	6	6	100	20.7	21.3	21.9	0.393	20.7	21.3	21.9	0.393

Notes:

Summary statistics were calculated using half the reporting limit for nondetected results.

NA - not applicable

SD - standard deviation

Table 5-3. Summary of Results for Metals/Metalloids in Fillet Composites on Wet Weight Basis

Analyte	Count of Results			All Sample Results				Detected Results Only			
	Total No.	No. of Detected Values	% Detected	Min	Mean	Max	SD	Min	Mean	Max	SD
Small Fish (Size Class A, 300 to 449 mm) (mg/kg ww except mercury)											
Aluminum	6	4	67	0.1	0.26	0.742	0.25	0.13	0.33	0.742	0.28
Antimony	6	2	33	0.001	0.0037	0.005	0.0021	0.001	0.001	0.001	0
Arsenic	6	6	100	0.031	0.048	0.062	0.012	0.031	0.048	0.062	0.012
Inorganic arsenic	6	0	0	0.002	0.002	0.002	3E-11	NA	NA	NA	NA
Barium	6	6	100	0.033	0.0609	0.0823	0.016	0.033	0.0609	0.0823	0.016
Beryllium	6	0	0	0.00195	0.002	0.00205	0.000041	NA	NA	NA	NA
Cadmium	6	6	100	0.0008	0.0013	0.0022	0.0006	0.0008	0.0013	0.0022	0.0006
Calcium	6	6	100	171	334	503	141	171	334	503	141
Chromium	6	6	100	0.036	0.086	0.15	0.042	0.036	0.086	0.15	0.042
Cobalt	6	6	100	0.0032	0.0039	0.0046	0.00056	0.0032	0.0039	0.0046	0.00056
Copper	6	6	100	0.213	0.357	0.489	0.101	0.213	0.357	0.489	0.101
Iron	6	5	83	1	3.8	7.33	2.4	2.07	4.33	7.33	2.24
Lead	6	6	100	0.001	0.0021	0.0031	0.00067	0.001	0.0021	0.0031	0.00067
Magnesium	6	6	100	281	286	293	5.47	281	286	293	5.47
Manganese	6	6	100	0.187	0.298	0.382	0.0737	0.187	0.298	0.382	0.0737
Mercury (µg/kg ww)	6	6	100	57.3	73.9	86.7	10.4	57.3	73.9	86.7	10.4
Nickel	6	6	100	0.016	0.04	0.068	0.019	0.016	0.04	0.068	0.019
Potassium	6	6	100	3800	3930	4040	83.9	3800	3930	4040	83.9
Selenium	6	6	100	0.281	0.484	0.768	0.201	0.281	0.484	0.768	0.201
Silver	6	3	50	0.0006	0.0014	0.00205	0.00069	0.0006	0.0008	0.001	0.0002
Sodium	6	6	100	281	359	410	46.7	281	359	410	46.7
Sulfur	6	6	100	1830	1920	1970	49.2	1830	1920	1970	49.2
Thallium	6	6	100	0.011	0.013	0.015	0.0016	0.011	0.013	0.015	0.0016
Uranium	6	0	0	0.00195	0.002	0.00205	0.000041	NA	NA	NA	NA
Vanadium	6	0	0	0.0195	0.02	0.0205	0.00041	NA	NA	NA	NA
Zinc	6	6	100	4.28	4.53	4.8	0.244	4.28	4.53	4.8	0.244
Large Fish (Size Class B, ≥ 450 mm) (mg/kg ww except mercury)											
Aluminum	6	4	67	0.1	0.32	0.81	0.28	0.15	0.43	0.81	0.28
Antimony	6	0	0	0.005	0.0054	0.0055	0.0002	NA	NA	NA	NA
Arsenic	6	6	100	0.055	0.083	0.12	0.022	0.055	0.083	0.12	0.022
Inorganic arsenic	6	0	0	0.002	0.002	0.0021	0.000041	NA	NA	NA	NA
Barium	6	6	100	0.0282	0.0399	0.0563	0.011	0.0282	0.0399	0.0563	0.011
Beryllium	6	0	0	0.00205	0.0021	0.0022	0.000052	NA	NA	NA	NA
Cadmium	6	6	100	0.0008	0.00092	0.001	0.000098	0.0008	0.00092	0.001	0.000098
Calcium	6	6	100	143	215	351	88.8	143	215	351	88.8
Chromium	6	6	100	0.054	0.097	0.18	0.051	0.054	0.097	0.18	0.051
Cobalt	6	6	100	0.0029	0.0039	0.0054	0.00098	0.0029	0.0039	0.0054	0.00098
Copper	6	6	100	0.2	0.26	0.379	0.063	0.2	0.26	0.379	0.063
Iron	6	4	67	0.95	2.2	3.24	1	2.43	2.82	3.24	0.448
Lead	6	6	100	0.001	0.005	0.02	0.0074	0.001	0.005	0.02	0.0074

Table 5-3. Summary of Results for Metals/Metalloids in Fillet Composites on Wet Weight Basis

Analyte	Count of Results			All Sample Results				Detected Results Only			
	Total No.	No. of Detected Values	% Detected	Min	Mean	Max	SD	Min	Mean	Max	SD
Large Fish (continued)											
Magnesium	6	6	100	279	287	295	6.41	279	287	295	6.41
Manganese	6	6	100	0.161	0.221	0.307	0.0636	0.161	0.221	0.307	0.0636
Mercury (µg/kg ww)	6	6	100	67.5	119	211	49.9	67.5	119	211	49.9
Nickel	6	6	100	0.028	0.046	0.085	0.024	0.028	0.046	0.085	0.024
Potassium	6	6	100	3880	4020	4120	83.6	3880	4020	4120	83.6
Selenium	6	6	100	0.55	0.636	0.772	0.089	0.55	0.636	0.772	0.089
Silver	6	0	0	0.00205	0.0021	0.0022	0.000052	NA	NA	NA	NA
Sodium	6	6	100	311	371	409	36.4	311	371	409	36.4
Sulfur	6	6	100	1940	2020	2070	49.4	1940	2020	2070	49.4
Thallium	6	6	100	0.0089	0.011	0.012	0.0012	0.0089	0.011	0.012	0.0012
Uranium	6	0	0	0.00205	0.0021	0.0022	0.000052	NA	NA	NA	NA
Vanadium	6	0	0	0.0205	0.021	0.022	0.00052	NA	NA	NA	NA
Zinc	6	6	100	4.15	4.34	4.56	0.168	4.15	4.34	4.56	0.168

Notes:

Summary statistics were calculated using half the reporting limit for nondetected results.

NA - not applicable

SD - standard deviation

Table 5-4. Comparison of ACGs to MRLs for Nondetected Results

Analyte	ACG ^a	Planned MRL ^a	Min MRL	Max MRL	No. Results	No. of Nondetected Results	No. of ACG Exceedances ^b
Metals/Metalloids (mg/kg dw except mercury)							
Aluminum	956	2	0.99	1	12	4	0
Antimony	0.382	0.05	0.05	0.05	12	10	0
Arsenic	0.5	0.5	NA	NA	12	0	NA
Barium	191.2	0.05	NA	NA	12	0	NA
Beryllium	1.912	0.02	0.02	0.02	12	12	0
Cadmium	0.956	0.02	NA	NA	12	0	NA
Calcium	4	4	NA	NA	12	0	NA
Chromium	0.0404	0.2	NA	NA	12	0	NA
Cobalt	0.2864	0.02	NA	NA	12	0	NA
Copper	38.2	0.1	NA	NA	12	0	NA
Inorganic arsenic	0.02	0.02	0.019	0.02	12	12	0
Iron	668	1	9.4	9.5	12	3	0
Lead	0.02	0.02	NA	NA	12	0	NA
Magnesium	2	2	NA	NA	12	0	NA
Manganese	133.6	0.05	NA	NA	12	0	NA
Mercury (µg/kg dw)	95.6	1	NA	NA	12	0	NA
Nickel	10.52	0.2	NA	NA	12	0	NA
Potassium	20	20	NA	NA	12	0	NA
Selenium	4.76	0.1	NA	NA	12	0	NA
Silver	4.76	0.02	0.02	0.02	12	9	0
Sodium	20	20	NA	NA	12	0	NA
Sulfur	8	8	NA	NA	12	0	NA
Thallium	0.02	0.02	NA	NA	12	0	NA
Uranium	0.1912	0.02	0.02	0.02	12	12	0
Vanadium	4.8	0.2	0.2	0.2	12	12	0
Zinc	286.4	0.5	NA	NA	12	0	NA
Conventional Parameters (% ww)							
Lipid	0.1	0.1	NA	NA	12	0	NA
Total moisture	0.1	0.1	NA	NA	12	0	NA

Notes:

^a Analytical concentration goals (ACGs) and planned method reporting limits (MRLs) were presented in Table A-2 of the QAPP addendum (CH2M Hill and SRC 2018). EPA revised Table A-2 on November 21, 2018 to update some of the ACGs (Tonel 2018). The values shown in this table are from revised Table A-2 of the Final QAPP.

^b Number of nondetected results for which the MRL exceeded the ACG.

NA - not applicable

APPENDIX A

UCR NORTHERN PIKE TISSUE SAMPLE COLLECTION FIELD SUMMARY REPORT

Final

UCR Northern Pike Tissue Sample Collection Field Summary Report

Prepared for
EPA Region 10

November 2018

CH2MHILL®

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Acronyms and Abbreviations

ALS	ALS Kelso Laboratory
CCT	Confederated Tribes of the Colville Reservation
COC	chain-of-custody
COI	chemical of interest
EPA	U.S. Environmental Protection Agency
FSP	field sampling plan
FSR	field summary report
FTL	field team lead
g	gram
GPS	global positioning system
HHRA	human health risk assessment
Lake Roosevelt	Franklin D. Roosevelt Lake
mm	millimeter
NPS	National Park Service
Parametrix	Parametrix, Inc.
QA	quality assurance
QA/QC	quality assurance and quality control
QC	quality control
QAPP	quality assurance project plan
RI/FS	remedial investigation and feasibility study
SCS	Spokane Courier Service
Site	Upper Columbia River site
SOP	standard operating procedure
STI	Spokane Tribe of Indians
TAL	Target Analyte List
TAI	Teck American Incorporated
TL	Total Length
UCR	Upper Columbia River
UCL95	95% Upper Confidence Limit
WDFW	Washington Department of Fish and Wildlife
WDOH	Washington Department of Health
%	percent

Introduction

This Field Summary Report (FSR) describes the procedures and methods that the field team used to collect Northern Pike (*Esox Lucius*) tissue samples during the 2018 sampling event. The FSR also provides summary information and details regarding sample locations, and sample quality assurance/quality control (QA/QC) included as an appendix to Addendum No. 2 to the Quality Assurance Project Plan for the 2009 Fish Tissue Study and Appendix A Field Sampling Plan - Upper Columbia River Northern Pike Tissue Study (Fish QAPP Addendum – Northern Pike) (CH2M 2018). This work was conducted in July 2018 by CH2M on behalf of the U.S. Environmental Protection Agency (EPA) at the Upper Columbia River (UCR) Site (Site)¹ in Washington.

The primary objective of the 2018 Northern Pike tissue study was to characterize the concentrations of target analyte list (TAL) metals, mercury, and inorganic arsenic in Northern Pike from the UCR that might be consumed by recreational and subsistence anglers. Data from the Northern Pike tissue study will be used to support the human health risk assessment (HHRA) to be conducted by the EPA as part of the remedial investigation and feasibility study (RI/FS) for the UCR Site and to support Washington State Department of Health (WDOH) efforts in evaluating the need for a Northern Pike fish consumption advisory.

1.1 Background

The 2009 Fish Tissue QAPP (Parametrix et al. 2009) focused on collection of several fish species and size classes in six reaches of the UCR Site. Sampling and analysis associated with the 2009 Fish Tissue Study QAPP was conducted in September and October 2009. The results of the 2009 investigation were documented in the UCR Fish Tissue Study Data Summary Report (Exponent and Parametrix 2013). Addendum No. 1 to the overarching 2009 QAPP focused on sampling and analysis of selected age classes of hatchery sturgeon tissue. The sturgeon tissue sampling program was conducted in 2016 and the results of the sturgeon tissue investigation were documented in White Sturgeon Tissue Data Summary Report (TAI 2017).

Northern Pike were not sampled in 2009 because their presence in the UCR was not documented at that time. Recent monitoring has shown rapidly increasing number of Northern Pike, with evidence of widespread and undesirable fish predation in the UCR. As a result, the Confederated Tribes of the Colville Reservation (CCT), one of the Lake Roosevelt fishery co-managers², is offering a \$10 per head bounty on Northern Pike collected from the UCR. Mercury concentrations in Northern Pike from the UCR are unknown but may be high enough to warrant a fish consumption advisory such as those placed on other piscivorous species in the UCR (e.g., Smallmouth and Largemouth Bass, Walleye) and on Northern Pike present in other water bodies in the region. Tissue data are needed for both the UCR HHRA and to assist WDOH in their review of the potential need for a UCR Northern Pike fish advisory.

1.2 Document Organization

This report is organized into the following sections:

- **Section 1** – Introduction. This section provides background information for the study and outlines the report organization.

¹ The Site is located wholly within Washington State and includes the portion of the UCR extending from the U.S.-Canadian border to Grand Coulee Dam, including Franklin D. Roosevelt Lake (Lake Roosevelt), and the areal extent of related contamination within the United States adjacent to the UCR.

² Lake Roosevelt Fisheries Co-Managers include the Colville Confederated Tribes (CCT), the Spokane Tribe of Indians (STI), and the Washington Department of Fish and Wildlife (WDFW).

- **Section 2** – Study Description. This section describes the purpose and objectives of the study and provides an overview of the study design.
- **Section 3** – Field Activities. This section identifies the methods used to collect the UCR Northern Pike samples and discusses any changes or deviations from the QAPP and field sampling plan (FSP).
- **Section 4** – References. This section presents bibliographic information for the documents cited within this report.
- Figures and data tables are provided following Section 4.

Field records and supporting information for the UCR Northern Pike sampling are provided in Appendix A and B.

Study Description

2.1 Purpose of Study

The purpose of the 2018 Northern Pike sampling event was to collect Northern Pike tissue to fill a data gap related to the assessment of risk to humans from the consumption of Northern Pike. This section presents a brief overview of the study design.

2.2 Study Design

The basis of the study design for the 2018 Northern Pike sampling was detailed in the QAPP Addendum – Northern Pike (CH2M 2018). Fish tissue samples were obtained from Northern Pike caught by the CCT and Spokane Tribe of Indians (STI) as part of the Northern Pike suppression program conducted by the Lake Roosevelt Fisheries Co-Managers³. The objective of the suppression program is to reduce or eliminate Northern Pike in the Lake Roosevelt watershed. Northern pike are an invasive species and are prohibited in the State of Washington and therefore were not released back to the water. All Northern Pike caught during suppression efforts were euthanized and removed.

Northern Pike suppression was conducted in the northern portion of the UCR extending from Gifford to Northport, Washington. The Lake Roosevelt Co-Manager sampling team recorded the global positioning system (GPS) coordinates (latitude and longitude) and water depth measurement (to the nearest 0.5 meter) where sampled fish were collected (i.e., point coordinates for gill nets). However, it is understood that location of collection may not necessarily correlate with exposure areas used in the HHRA.

The Northern Pike tissue study targeted two size bins; 300 to 449 millimeters (mm) total length (TL), and 450 mm and greater TL; these bins represent the sizes of Northern Pike that are likely consumed by people throughout the UCR. The first 60 individual fish that met size requirements for each bin (30 of each size bin) were euthanized by the Lake Roosevelt Fisheries Co-Managers and transferred to CH2M staff.

2.2.1 Composite Samples

Composites of the Northern Pike fillets are expected to produce data that exhibit variability less than or equal to the variability found in the fish tissue composite data from the 2009 Fish Tissue Study. To increase the likelihood of producing data with sufficiently low variability relative to the 2009 Fish Tissue Study, EPA requested a minimum of 60 Northern Pike from the Lake Roosevelt Fisheries Co-managers. Thirty fish were collected from each size bin (300 to 449 mm TL, and greater than or equal to 450 mm TL).

Compositing took place in the laboratory. Each composite was created from the homogenate from five randomly-selected fillets in the same size class. A total of 12 composite samples were prepared (six composites for the 300 to 449 mm TL size range and six composites for the equal to and greater than 450 mm TL size range). The composites were determined by EPA using a stratified random approach based on the length of each fish. The fish in each size class were sorted by TL (shortest to longest), then the six smallest fish was randomly assigned to Composites 1, 2, 3, 4, 5, or 6. Then the next set of six fish was randomly assigned to the six composites, and so on, until each composite had five randomly assigned fish.

EPA provided the list of composite assignments to Teck American Incorporated (TAI) on the same day that the Northern Pike fillets were sent to the laboratory.

³ The Washington Department of Fish and Wildlife (WDFW) is also a Lake Roosevelt Fisheries co-manager. However, the WDFW did not participate in 2018 Northern Pike field activities.

2.2.2 Chemical Analyses

The suite of chemicals for analysis in fish tissues included conventional parameters (total length and mass, percent moisture, percent lipid), common target analyte list (TAL) metals/metalloids identified as chemicals of interest (COIs) in the 2009 HHRA work plan (USEPA 2009), and total inorganic arsenic.

Field Activities and Methods

The 2018 Northern Pike sampling effort was outlined in the EPA-approved Fish QAPP Addendum No 2 – Northern Pike and detailed in Appendix A of the addendum (Field Sampling Plan - Upper Columbia River Northern Pike Tissue Study). Sampling was conducted by CH2M personnel.

This section discusses the methods and procedures used during the 2018 Northern Pike tissue sampling event. Field sampling activities were conducted from July 24 to July 27, 2018. All field activities and sample collection methods were performed in accordance with the EPA-approved QAPP and FSP; there were no deviations from the QAPP/FSP in the collection, handling, and processing of samples for this effort.

3.1 Fish Sampling

Northern Pike were collected by Lake Roosevelt Fisheries Co-Managers (CCT & STI) via gill netting and whole fish were provided to CH2M for processing. The Lake Roosevelt Co-Manager sampling team recorded the global positioning system (GPS) coordinates (latitude and longitude) where fish were collected (i.e., point coordinates for gill nets).

Sample processing was performed by one field team consisting of two CH2M personnel (Table 1). CH2M performed all duties and responsibilities for sample preparation, sample collection, and sample handling. Sample pick-up and processing was conducted on a boat provided by the National Park Service (NPS).

A total of 60 Northern Pike were collected during the field effort. The chronology for sample collection activities is summarized in Table 2.

3.1.1 Equipment

Field equipment and supplies for the CH2M fish processing team included fish filleting equipment, decontamination supplies, sample containers, coolers, shipping containers, logbooks and forms, personal protective equipment (cut-resistant gloves), and personal gear. Nitrile gloves were also worn while filleting and handing Northern Pike tissue samples to minimize the possibility of cross-contamination between fish.

Sample containers were clearly labeled at the time the tissue samples were taken from the Northern Pike. Labels included the task name, sample location and number, CH2M sampler's initials, analyses to be performed, and sample date and time.

3.1.2 Fish Sizes

Northern Pike tissue composites were grouped based on two fish sizes: 300-449 mm, and 450 mm and greater. Thirty Northern Pike were collected from each size group for a total of 60 fish. The 30 fish for each size group were divided into 6 composite samples, with 5 individual fish per composite (Table 3) for a total of 12 composite samples.

3.1.3 Fish Collection Locations

Figure 1 shows the locations recorded by the Lake Roosevelt Fisheries Co-Manager sampling team where the Northern Pike for tissue sampling were caught (i.e., point coordinates for gill nets). These coordinates are listed, along with the fish identification numbers, in Table 4.

3.1.4 Fish Collection and Handling

All Northern Pike were measured for TL (mm) by the Lake Roosevelt Fisheries Co-Managers upon retrieval from the gill net. Northern Pike were euthanized using a sharp blow to the head being careful not to break the skin of the fish.

Specimens of Northern Pike that met the size class requirements for tissue sampling were transferred to CH2M for tissue sample processing. The Lake Roosevelt Fisheries Co-Managers provided CH2M with the GPS coordinates at the time the fish was transferred (Table 4).

3.1.5 Sample Tissue Processing

All fish processing was performed on the boat operated by the NPS. The processing boat either traveled to shore and fish processing was conducted on the boat while beached to provide a stable platform, or if calm water permitted, fish were processed while the boat floated in water deeper than 50 ft. The fish were held in decontaminated plastic tubs prior to processing.

Fish were photographed and examined for external abnormalities, weighed, filleted with skin removed, and at least 40 g of fillet was collected, wrapped in foil, and placed in a resealable plastic bag. The bagged fillets were then placed inside a second bag with the fish ID label so that this label was between the two resealable plastic bags and placed in a cooler on ice. During filleting, no internal organs were punctured. Stomach contents were only examined if there was an obvious abnormality and this was only done as a point of interest as no gut analysis was completed. Table 4 shows individual fillet weights and sample weights for each fish.

3.1.6 Equipment Decontamination Procedures

The field team thoroughly rinsed all sampling equipment that came into contact with fish between samples and upon completion of the study.

Rinsing was done using river water away from the shoreline and any areas where sediment had been disturbed during beaching of the boat. Equipment used for processing the fish was washed with soap (i.e., Alconox™) and rinsed with river water and distilled water after each use. Nitrile gloves used for handling fish were discarded, not decontaminated. Clean gloves were worn when handling each fish to avoid transfer of potential contaminants among samples.

3.1.7 Sample Numbering

Individual fish were identified with the letters “EPA”, a species abbreviation, length group, and a sequential number (e.g., EPA-NP-A-001). The codes included the following information:

Species abbreviation:

- NP = Northern Pike

Length groups are:

- A = 300 to 449 mm TL
- B = 450 mm TL and greater

3.1.8 Field Documentation

All sampling and associated field activities were documented on activity-specific field forms, field logbooks, and digital photographs.

3.1.8.1 Field Logbook

Daily field activities were documented through journal entries in a bound field logbook by the field team lead for the duration of the Northern Pike sampling effort. The field logbooks contain all pertinent information about staff present, site arrival and departure times, health and safety pre-task meetings, sampling activities, site conditions, field methods, site sketches, general observations, and other pertinent technical information. Field logbook entries followed generally accepted professional standards and procedures described in the FSP. The field logbooks and sampling records are part of the permanent project record and are provided in Appendix B.

3.1.8.2 Digital Photographs

Digital photographs were taken during sampling activities to document sampling procedures, site locations and conditions, and other pertinent activities. Photographs were taken of each Northern Pike. A dry-erase white board bearing the sample name, date and time, was held in the photograph for reference. The photographs are part of the permanent project record and have been scanned and saved in the project folder.

3.1.8.3 Dedicated Field Forms

All sampling and associated activities were documented on activity-specific field forms. The field forms contained information and data specific to each Northern Pike. Completed field forms are provided in Appendix B, and a brief description of each form is provided below.

- **Daily Field Collection Form:** Sample ID, date, time, weight of fillet, weight of sample, and collector's initials
- **External Examination Form:** Sample ID, date, time, weight, length, species and any abnormalities in the following: body surface, eyes, head, opercula, fins, and gills.

3.1.8.4 Waste Disposal

After processing of the Northern Pike tissue, the carcass was resected into two pieces to ensure the swim bladder was punctured. The carcass and unused fillet tissue was then sunk in the deeper channel of the reservoir.

Limited waste was produced during the 2018 Northern Pike sampling effort. During decontamination of equipment, an Alconox and distilled water mixture was generated and reserved in a bucket until returning to the Kettle Falls boat launch after each day at which time it was disposed of into the facility's septic system. All general refuse (such as gloves, paper towels, plastic bags) was disposed of in the dumpster at the Kettle Falls boat launch.

3.2 Sample Handling and Custody

The following section describes the handling, storage, and shipment procedures for samples collected for the 2018 Northern Pike sampling effort. All samples remained in the custody of CH2M, or with the transportation courier at all times until delivery to the analytical laboratory. Custody procedures for the sampling event were in accordance with the FSP.

3.2.1 Sample Storage

All samples were temporarily stored on wet ice in a cooler immediately after collection. At the end of each day, samples were frozen on dry ice and kept in either a locked vehicle or locked hotel room in custody of CH2M.

3.2.2 Sample Management

All samples were packaged and labeled for shipment in compliance with the chain of custody procedures described in the FSP. A list of the samples collected by the field team, including the sample date and time, was provided to EPA and the CH2M project manager at the end of each field day. Scribe sample management software was used to generate permanent sample labels and chains-of-custody (COCs) for the samples. Each Scribe label and COC was checked against the list of sample IDs provided on the sample tracking sheet, and again checked against the temporary label on the sample container to ensure each container was properly labeled. Clear plastic tape was placed over each Scribe label to protect the label from damage. The labeled samples and COCs were placed in coolers with ice for shipment to the analytical laboratory. Following shipment of samples to the analytical laboratory, the required Scribe sample management documentation was submitted to the EPA via the sample management office (SMO) portal and the laboratory was notified of the shipment.

3.2.3 Sample Transportation

Spokane Courier Service (SCS) of Spokane was hired to transport the samples directly to the ALS analytical laboratory located in Kelso, Washington. One courier trip was used to ship samples to the lab at the end of the sampling event.

Custody sealed sample coolers were dropped off with SCS in Spokane and samples were in the custody of SCS until they were hand-delivered to ALS. CH2M discussed proper security, storage of the vehicle, and handling with SCS to ensure that chain of custody was preserved. Samples were delivered to ALS and custody was transferred from the courier driver to the lab.

3.3 Northern Pike Tissue Composite Assignments

Table 5 lists the fish sample assignments for each composite.

SECTION 4

References

CH2M Hill. 2018. Appendix A Field Sampling Plan - Upper Columbia River Northern Pike Tissue Study (Addendum No. 2 to the QAPP for the 2009 Fish Tissue Study). Prepared for, and with oversight by, United States Environmental Protection Agency, Region 10.

Exponent and Parametrix. 2013. Upper Columbia River Final Fish Tissue Data Summary and Data Gap Report. Prepared for Teck American Incorporated. Prepared by Exponent and Parametrix, in consultation with Integral Consulting, Inc. February.

Parametrix, Integral, and Exponent. 2009. Upper Columbia River Quality Assurance Project Plan for the 2009 Fish Tissue Study. Prepared for Teck American Incorporated, Spokane, WA. Prepared in consultation with HydroQual. September.

TAI. 2017. Upper Columbia River. Draft White Sturgeon Tissue Study Data Summary Report. Prepared for Teck American Incorporated by Windward Environmental in association and consultation with Ramboll Environ and Parametrix, Inc. February.

USEPA. 2009. Human health risk assessment work plan for the Upper Columbia River site remedial investigation and feasibility study. Prepared for, and with oversight by, United States Environmental Protection Agency, Region 10. Prepared by Syracuse Research Corporation. March.

Tables

Table 1

2018 Northern Pike Sampling Personnel

Date	CH2M Personnel	Activities
7/24/2018	Kelly O'Neal Josh Yount	Filleting Northern Pike
7/25/2018	Kelly O'Neal Josh Yount	Filleting Northern Pike
7/26/2018	Kelly O'Neal Josh Yount	Filleting Northern Pike
7/27/2018	Kelly O'Neal Josh Yount	Sample packaging and delivery to courier

Table 2

Daily Counts of Northern Pike per Size Class

Date	A (300-449 mm)	B (450 mm and greater)
7/24/2018	10	11
7/25/2018	14	10
7/26/2018	6	9
Total	30	30

mm = millimeters

Table 3

Number of Fish per Composite

	Size Range	
	A 300-449 mm	B 450 mm and greater
Composite 1	5	5
Composite 2	5	5
Composite 3	5	5
Composite 4	5	5
Composite 5	5	5
Composite 6	5	5
Total	30	30

mm = millimeters

Table 4

Length, Total Weight, Fillet Weight of Northern Pike and Coordinates of Gill Nets

Individual Fish ID	Date	Time	Length (mm)	Total Weight (g)	Weight of Fillet (g)	Latitude	Longitude	Collector Initial
EPA-NP-A-001	7/24/2018	10:08	375	350	100	48.63147	-118.08023	KLO, JY
EPA-NP-A-002	7/24/2018	10:30	445	590	136	48.63147	-118.08023	KLO, JY
EPA-NP-A-003	7/24/2018	10:53	410	495	95	48.65706	-118.10989	KLO, JY
EPA-NP-A-004	7/24/2018	11:52	445	605	140	48.65320	-118.11044	KLO, JY
EPA-NP-A-005	7/24/2018	13:43	449	600	100	48.63033	-118.07862	KLO, JY
EPA-NP-A-006	7/24/2018	13:46	445	555	120	48.63033	-118.07862	KLO, JY
EPA-NP-A-007	7/24/2018	14:07	440	595	135	48.62852	-118.07698	KLO, JY
EPA-NP-A-008	7/24/2018	14:56	440	495	120	48.62952	-118.07698	KLO, JY
EPA-NP-A-009	7/24/2018	15:30	380	350	115	48.68369	-118.07938	KLO, JY
EPA-NP-A-010	7/24/2018	15:36	410	500	130	48.68369	-118.07938	KLO, JY
EPA-NP-B-001	7/24/2018	11:20	660	2275	400	48.65706	-118.10989	KLO, JY
EPA-NP-B-002	7/24/2018	11:39	460	655	180	48.65320	-118.11044	KLO, JY
EPA-NP-B-003	7/24/2018	12:15	1070	7830	1130	48.66515	-118.06994	KLO, JY
EPA-NP-B-004	7/24/2018	13:00	460	645	160	48.66515	-118.06994	KLO, JY
EPA-NP-B-005	7/24/2018	14:20	455	630	165	48.62952	-118.07698	KLO, JY
EPA-NP-B-006	7/24/2018	14:38	455	690	165	48.62952	-118.07698	KLO, JY
EPA-NP-B-007	7/24/2018	15:14	700	2540	890	48.68369	-118.07938	KLO, JY
EPA-NP-B-008	7/24/2018	15:49	455	635	135	48.68319	-118.07943	KLO, JY
EPA-NP-B-009	7/24/2018	16:00	465	705	180	48.68319	-118.07943	KLO, JY
EPA-NP-B-010	7/24/2018	16:13	750	3210	620	48.69331	-118.01560	KLO, JY
EPA-NP-B-011	7/24/2018	16:26	710	2445	460	48.69331	-118.01560	KLO, JY
EPA-NP-A-011	7/25/2018	11:00	445	600	160	48.62643	-118.07375	KLO, JY
EPA-NP-A-012	7/25/2018	12:37	425	585	160	48.68350	-118.07941	KLO, JY
EPA-NP-A-013	7/25/2018	12:52	395	375	90	48.68350	-118.07941	KLO, JY
EPA-NP-A-014	7/25/2018	13:02	375	340	75	48.68350	-118.07941	KLO, JY
EPA-NP-A-015	7/25/2018	13:10	425	510	170	48.68350	-118.07941	KLO, JY
EPA-NP-A-016	7/25/2018	14:16	410	545	95	48.68385	-118.08244	KLO, JY
EPA-NP-A-017	7/25/2018	15:01	440	480	110	48.62167	-118.07317	KLO, JY
EPA-NP-A-018	7/25/2018	15:11	370	250	95	48.62167	-118.07317	KLO, JY
EPA-NP-A-019	7/25/2018	15:43	410	425	95	48.61752	-118.09050	KLO, JY
EPA-NP-A-020	7/25/2018	16:06	430	525	110	48.64663	-118.08147	KLO, JY

Table 4

Length, Total Weight, Fillet Weight of Northern Pike and Coordinates of Gill Nets

Individual Fish ID	Date	Time	Length (mm)	Total Weight (g)	Weight of Fillet (g)	Latitude	Longitude	Collector Initial
EPA-NP-A-021	7/25/2018	17:00	420	555	90	48.57411	-118.09495	KLO, JY
EPA-NP-A-022	7/25/2018	17:10	449	555	170	48.57365	-118.08813	KLO, JY
EPA-NP-A-023	7/25/2018	17:17	425	525	110	48.57365	-118.08813	KLO, JY
EPA-NP-A-024	7/25/2018	17:24	390	415	90	48.57365	-118.08813	KLO, JY
EPA-NP-B-012	7/25/2018	10:01	450	490	125	48.62930	-118.07656	KLO, JY
EPA-NP-B-013	7/25/2018	12:24	465	755	175	48.68350	-118.07941	KLO, JY
EPA-NP-B-014	7/25/2018	13:20	710	2340	490	48.68350	-118.07941	KLO, JY
EPA-NP-B-015	7/25/2018	14:35	500	835	140	48.66355	-118.07326	KLO, JY
EPA-NP-B-016	7/25/2018	14:50	500	835	210	48.66508	-118.06999	KLO, JY
EPA-NP-B-017	7/25/2018	15:19	480	730	165	48.62006	-118.07358	KLO, JY
EPA-NP-B-018	7/25/2018	15:32	460	545	115	48.62006	-118.07358	KLO, JY
EPA-NP-B-019	7/25/2018	15:56	450	590	195	48.61752	-118.09050	KLO, JY
EPA-NP-B-020	7/25/2018	16:16	455	700	150	48.64663	-118.08147	KLO, JY
EPA-NP-B-021	7/25/2018	16:30	495	890	180	48.57411	-118.09495	KLO, JY
EPA-NP-A-025	7/26/2018	10:45	420	495	90	48.68360	-118.07849	KLO, JY
EPA-NP-A-026	7/26/2018	10:57	440	525	140	48.68376	-118.08071	KLO, JY
EPA-NP-A-027	7/26/2018	11:11	449	495	90	48.68376	-118.08071	KLO, JY
EPA-NP-A-028	7/26/2018	11:27	410	440	110	48.68376	-118.08071	KLO, JY
EPA-NP-A-029	7/26/2018	11:41	415	420	105	48.68368	-118.07947	KLO, JY
EPA-NP-A-030	7/26/2018	12:30	440	570	130	48.68353	-118.08205	KLO, JY
EPA-NP-B-022	7/26/2018	9:26	500	890	165	48.66612	-118.06889	KLO, JY
EPA-NP-B-023	7/26/2018	9:40	465	670	145	48.66612	-118.06889	KLO, JY
EPA-NP-B-024	7/26/2018	12:50	475	715	125	48.65296	-118.08488	KLO, JY
EPA-NP-B-025	7/26/2018	13:18	525	1015	220	48.57335	-118.08826	KLO, JY
EPA-NP-B-026	7/26/2018	14:13	460	660	110	48.57335	-118.08826	KLO, JY
EPA-NP-B-027	7/26/2018	14:28	660	1890	350	48.57401	-118.09178	KLO, JY
EPA-NP-B-028	7/26/2018	14:43	465	650	150	48.57434	-118.09444	KLO, JY
EPA-NP-B-029	7/26/2018	15:06	615	1560	285	48.65262	-118.11034	KLO, JY
EPA-NP-B-030	7/26/2018	15:21	505	775	130	48.57386	-118.08707	KLO, JY

mm = millimeters; g = grams; KLO = Kelly O'Neal; JY = Josh Yount

Table 5

Composite Sample Assignments

Size Class	Composite Number	Individual Fish ID	Total Length (mm)	Fish Composite ID
A	1	EPA-NP-A-024	390	EPA-NP-A1
		EPA-NP-A-016	410	
		EPA-NP-A-021	420	
		EPA-NP-A-002	445	
		EPA-NP-A-005	449	
	2	EPA-NP-A-014	375	EPA-NP-A2
		EPA-NP-A-003	410	
		EPA-NP-A-015	425	
		EPA-NP-A-017	440	
		EPA-NP-A-006	445	
	3	EPA-NP-A-013	395	EPA-NP-A3
		EPA-NP-A-029	415	
		EPA-NP-A-023	425	
		EPA-NP-A-026	440	
		EPA-NP-A-022	449	
	4	EPA-NP-A-018	370	EPA-NP-A4
		EPA-NP-A-010	410	
		EPA-NP-A-020	430	
		EPA-NP-A-008	440	
		EPA-NP-A-027	449	
	5	EPA-NP-A-001	375	EPA-NP-A5
		EPA-NP-A-019	410	
		EPA-NP-A-025	420	
		EPA-NP-A-030	440	
		EPA-NP-A-004	445	
	6	EPA-NP-A-009	380	EPA-NP-A6
		EPA-NP-A-028	410	
		EPA-NP-A-012	425	
		EPA-NP-A-007	440	
		EPA-NP-A-011	445	

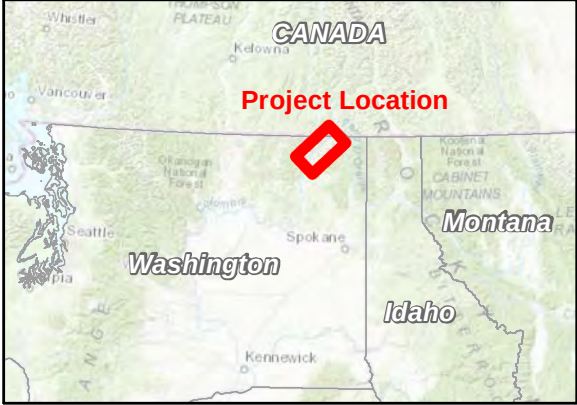
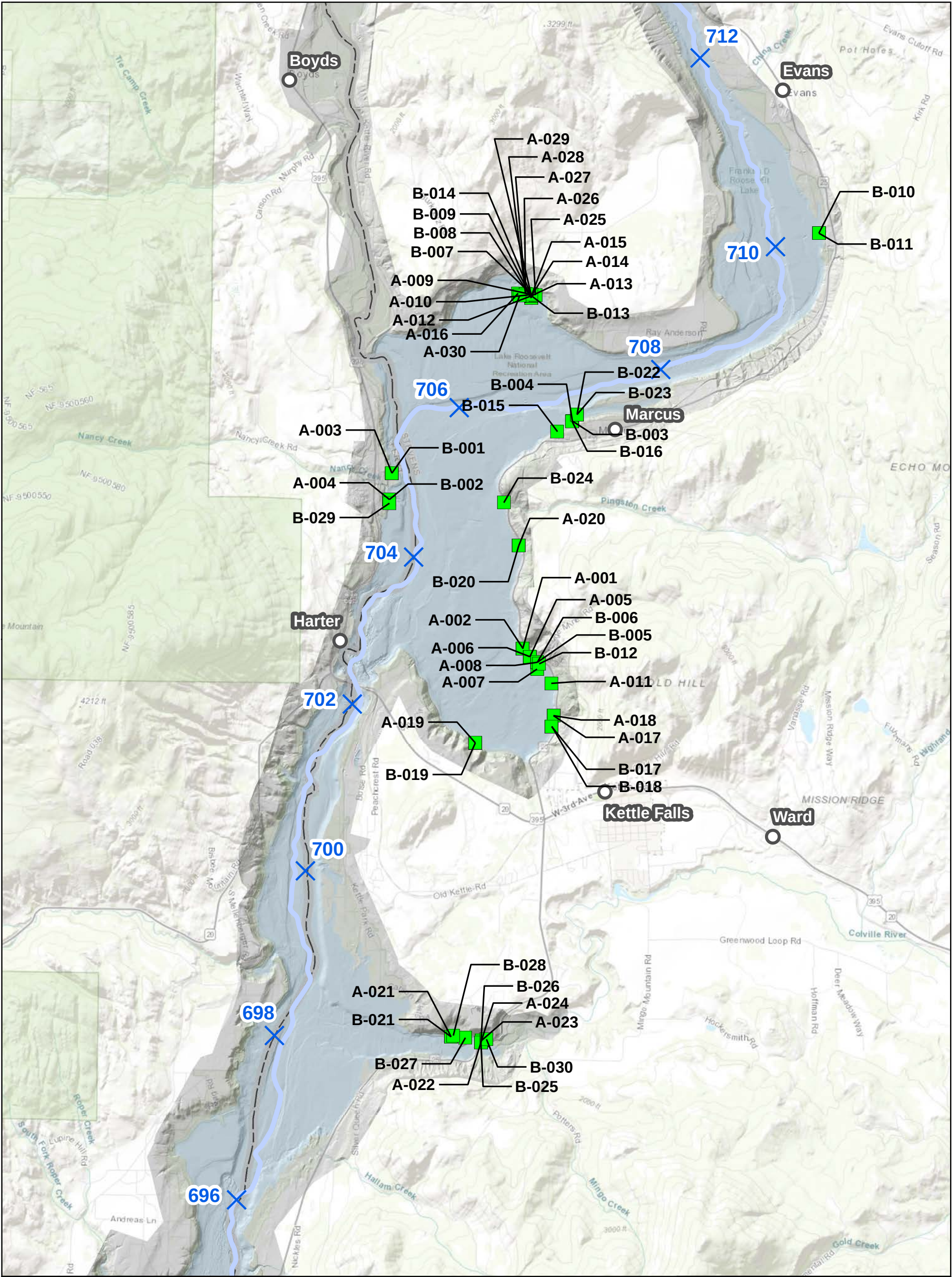
Table 5

Composite Sample Assignments

Size Class	Composite Number	Individual Fish ID	Total Length (mm)	Fish Composite ID
B	1	EPA-NP-B-006	455	EPA-NP-B1
		EPA-NP-B-013	465	
		EPA-NP-B-023	465	
		EPA-NP-B-030	505	
		EPA-NP-B-027	660	
	2	EPA-NP-B-012	450	EPA-NP-B2
		EPA-NP-B-026	460	
		EPA-NP-B-015	500	
		EPA-NP-B-016	500	
		EPA-NP-B-007	700	
	3	EPA-NP-B-008	455	EPA-NP-B3
		EPA-NP-B-018	460	
		EPA-NP-B-021	495	
		EPA-NP-B-001	660	
		EPA-NP-B-010	750	
	4	EPA-NP-B-020	455	EPA-NP-B4
		EPA-NP-B-004	460	
		EPA-NP-B-028	465	
		EPA-NP-B-029	615	
		EPA-NP-B-014	710	
	5	EPA-NP-B-005	455	EPA-NP-B5
		EPA-NP-B-002	460	
		EPA-NP-B-024	475	
		EPA-NP-B-025	525	
		EPA-NP-B-011	710	
	6	EPA-NP-B-019	450	EPA-NP-B6
		EPA-NP-B-009	465	
		EPA-NP-B-017	480	
		EPA-NP-B-022	500	
		EPA-NP-B-003	1070	

A = 300-449 mm size class; B = ≥ 450 mm size class

Figures



LEGEND

- Northern Pike Catch Location
- River Miles
- National Forest
- County

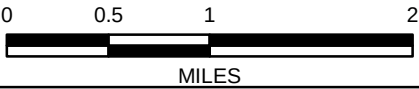


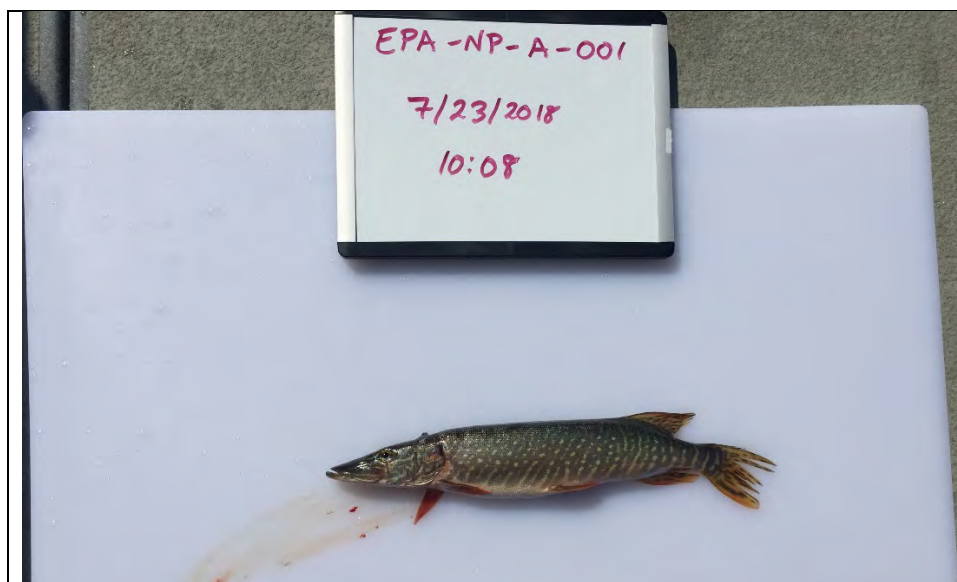
FIGURE 1
Northern Pike Tissue
Sample Collection
Locations

S.JENNIGES/PDX: 09/06/18
K. O'Neal/SAC: 09/06/18



Appendix A

Photo Log



EPA-NP-A-001 – Please note the date is incorrect in the photo. Fish was processed 7/24/2018



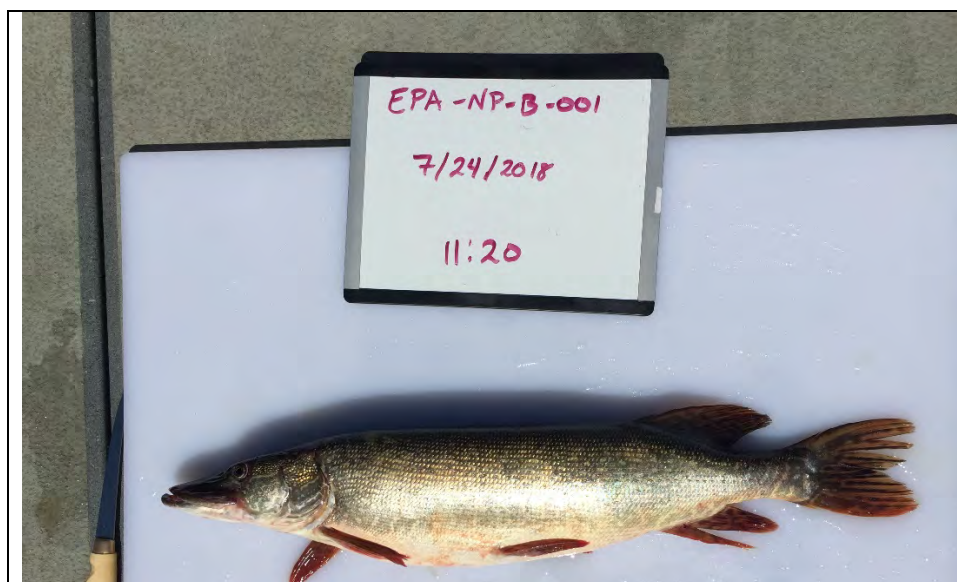
EPA-NP-A-001 – Example of fillet sample - Please note the date is incorrect in the photo. Fish was processed 7/24/2018



EPA-NP-A-002 – Please note the date is incorrect in the photo. Fish was processed 7/24/2018



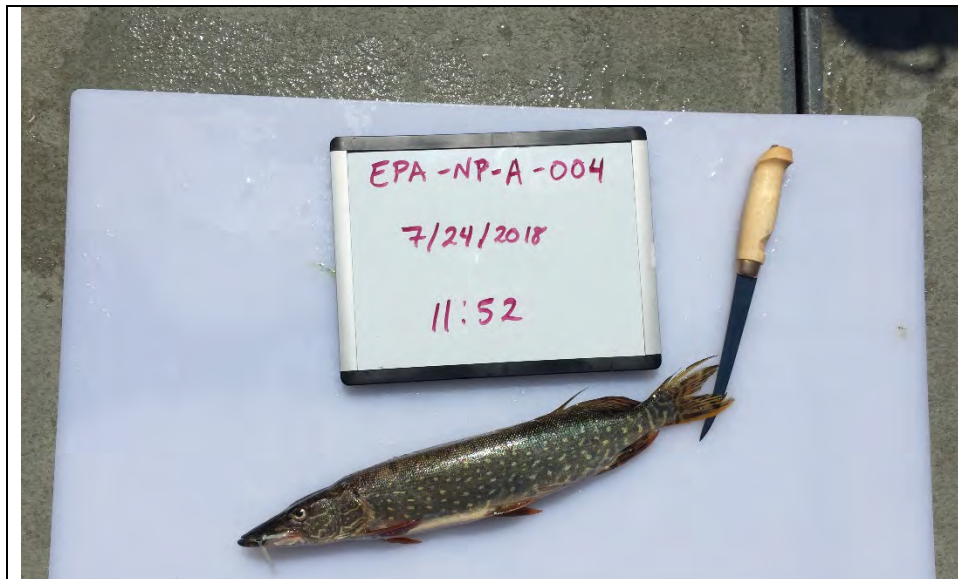
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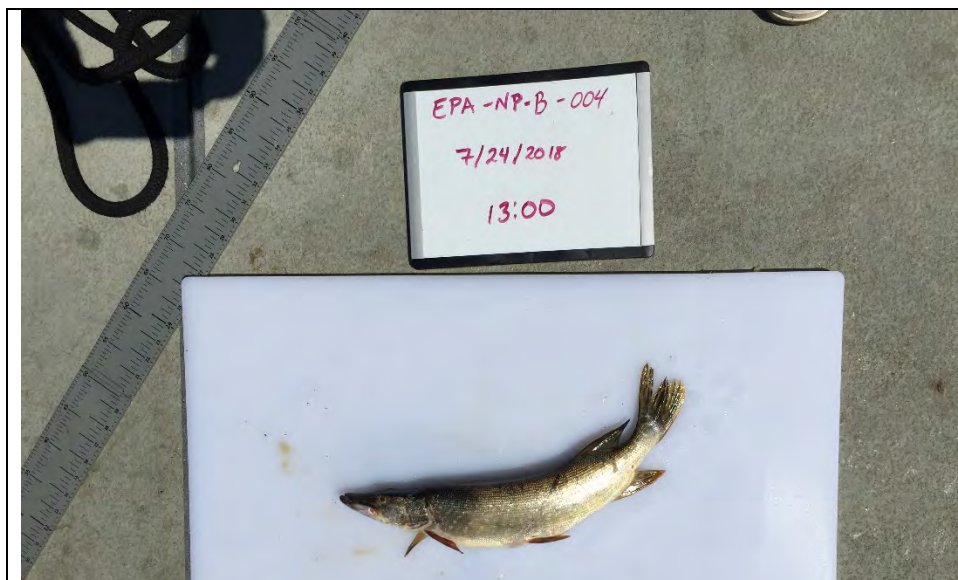
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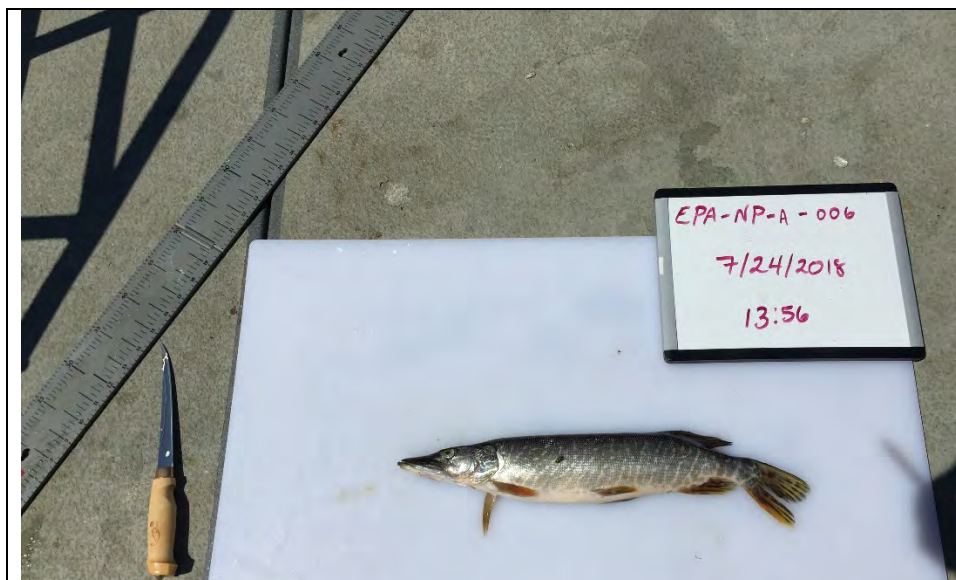
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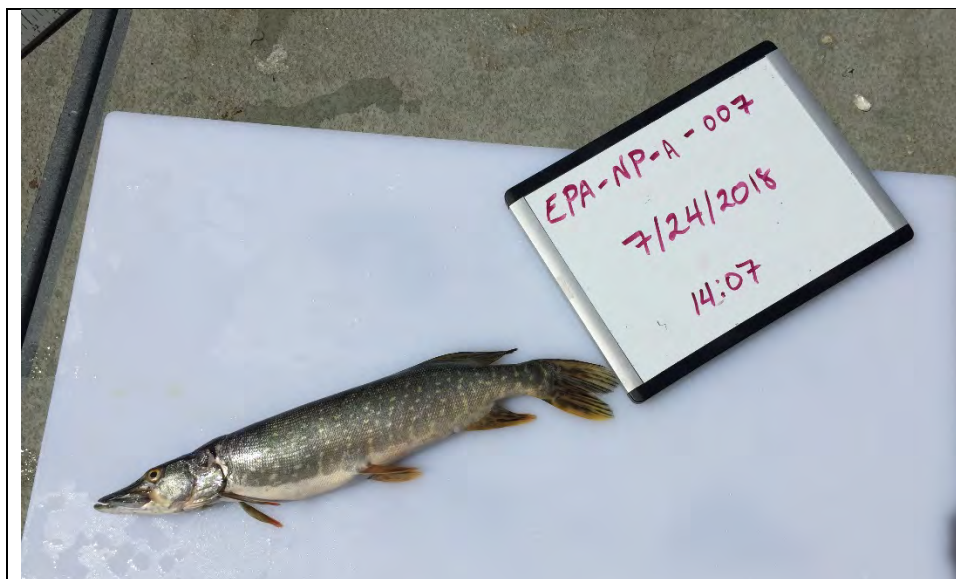
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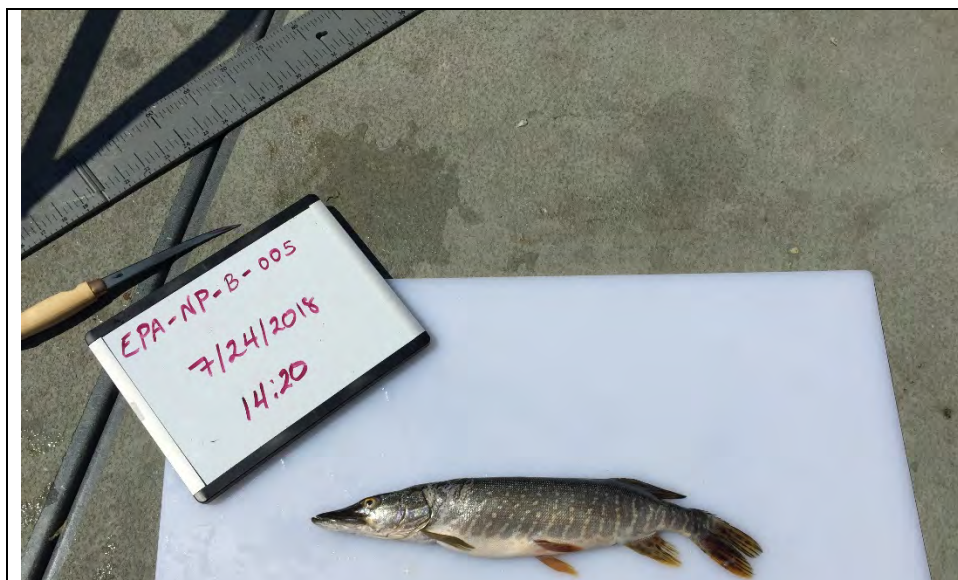
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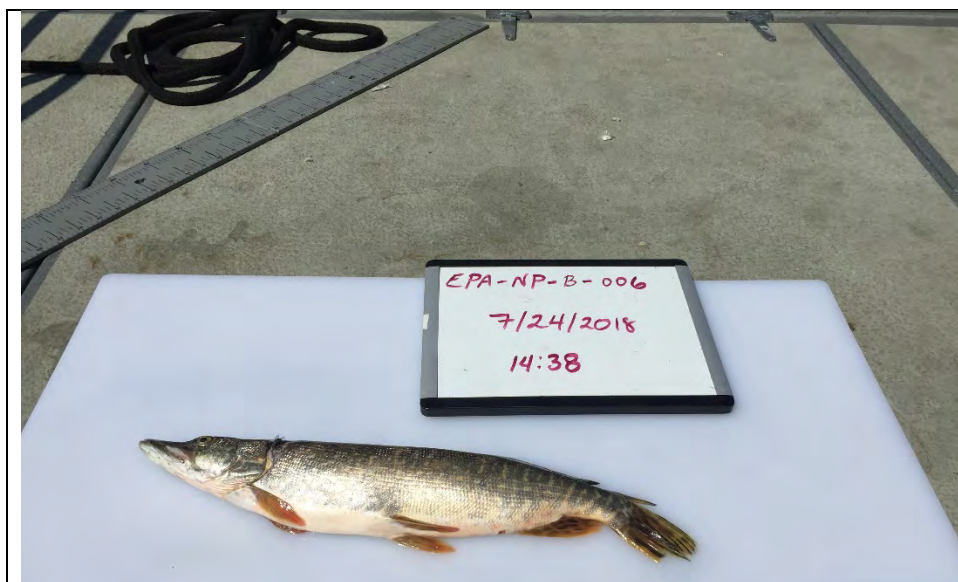
EPA-NP-A-006 – Please note, the time was recorded incorrectly on the white board in the photo. The correct time is 13:46



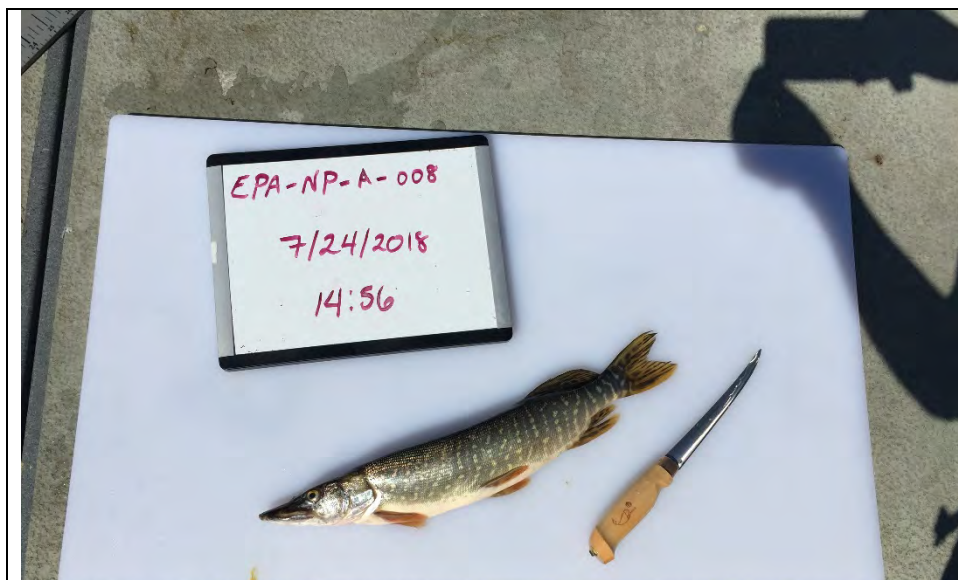
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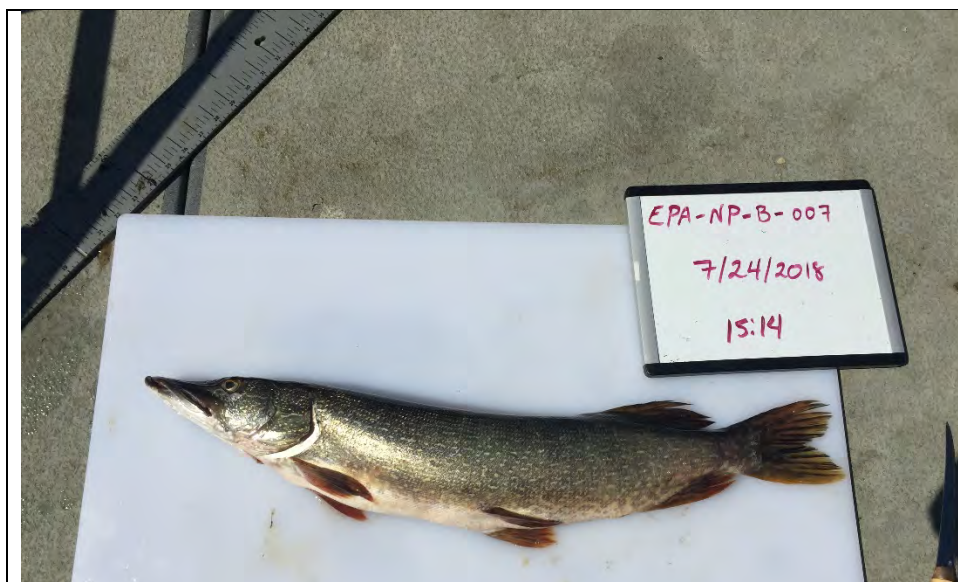
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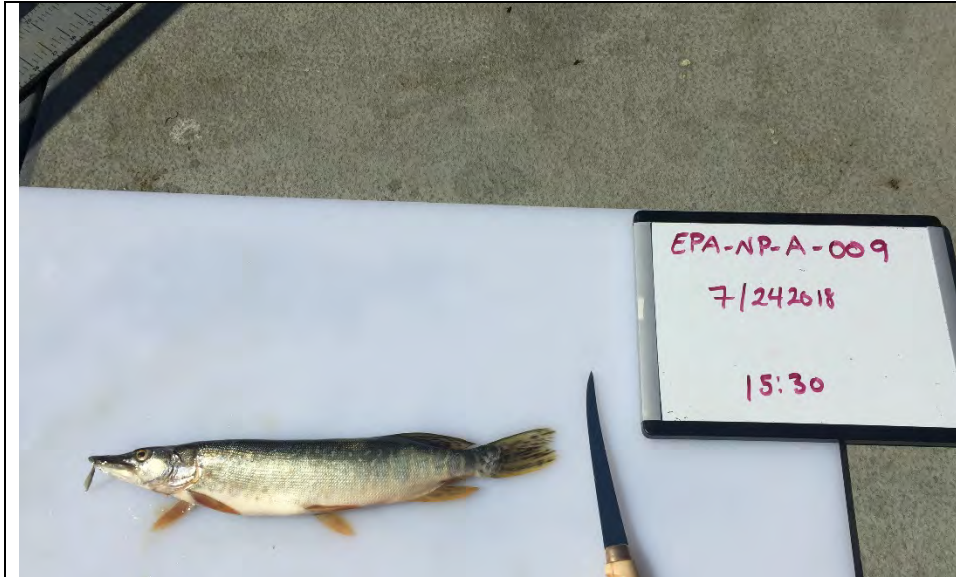
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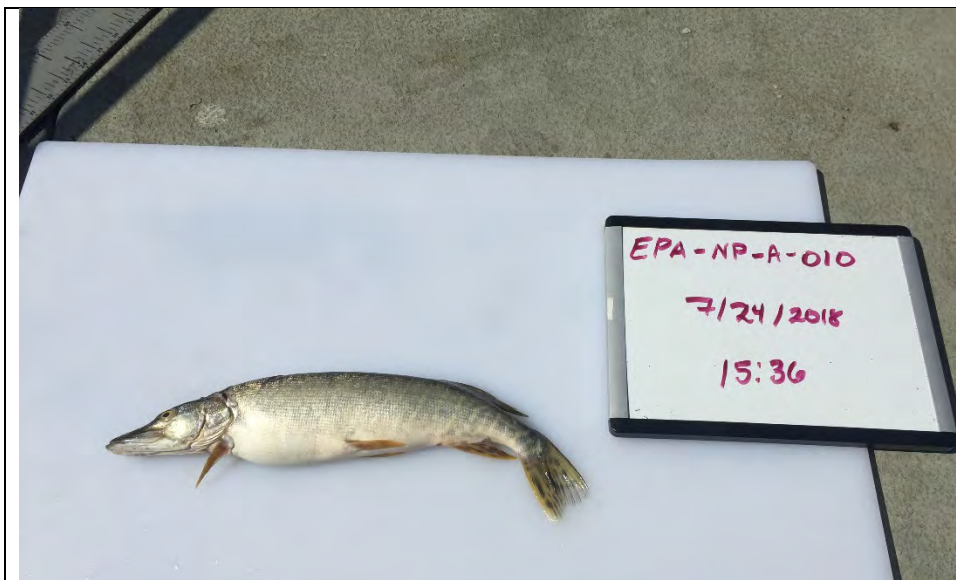
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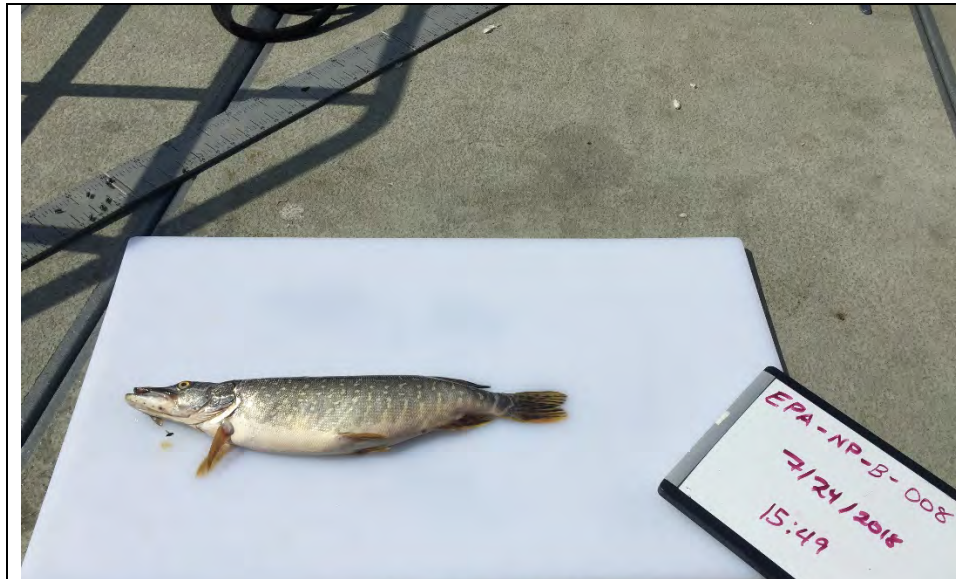
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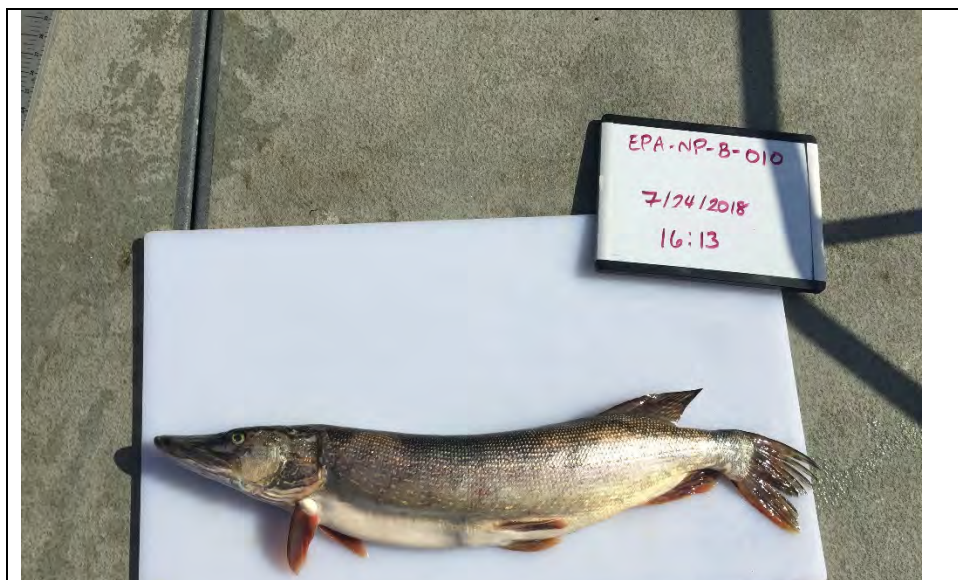
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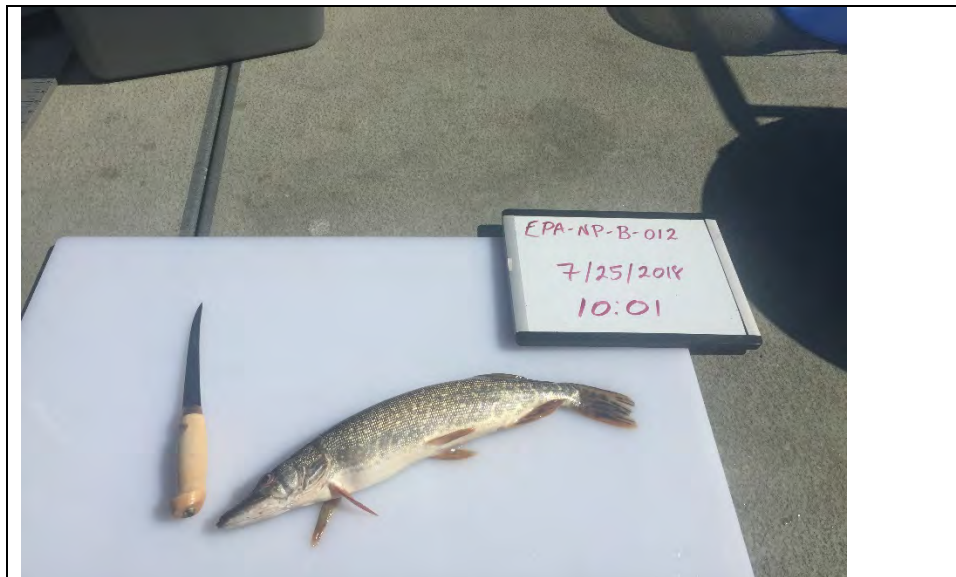
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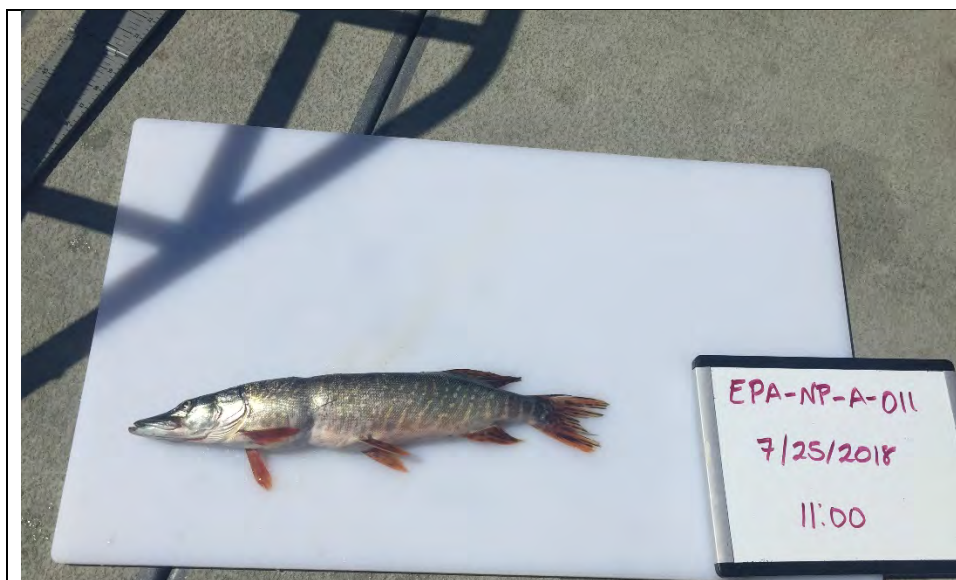
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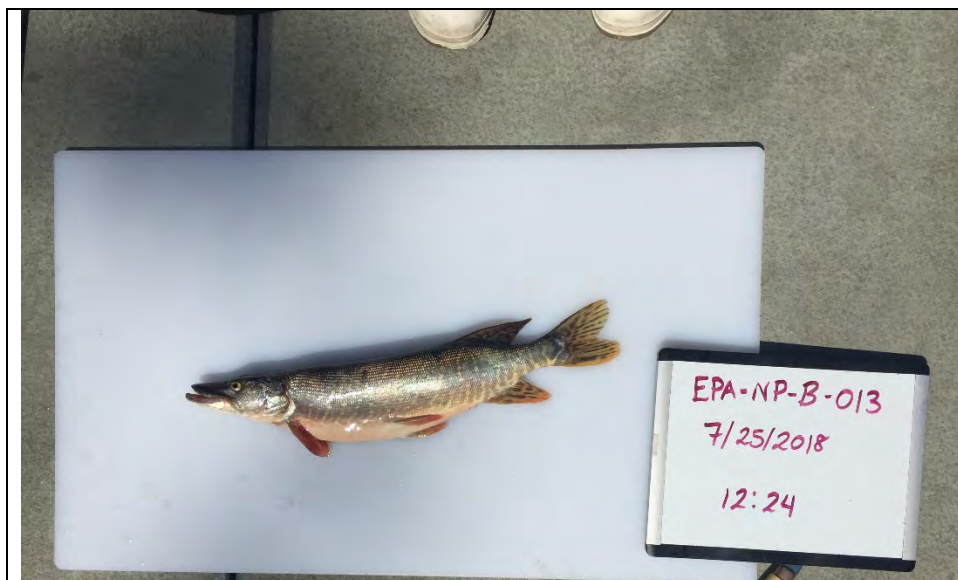
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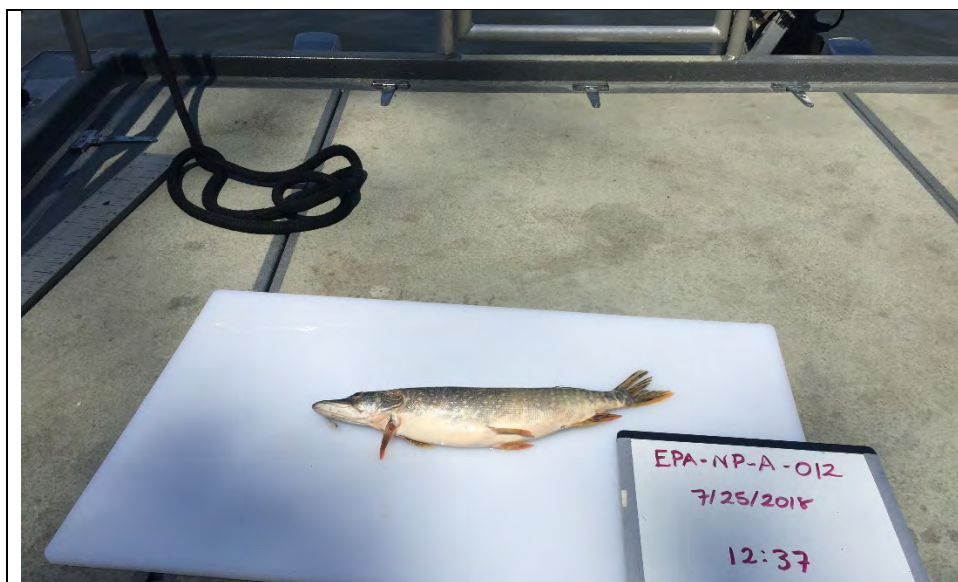
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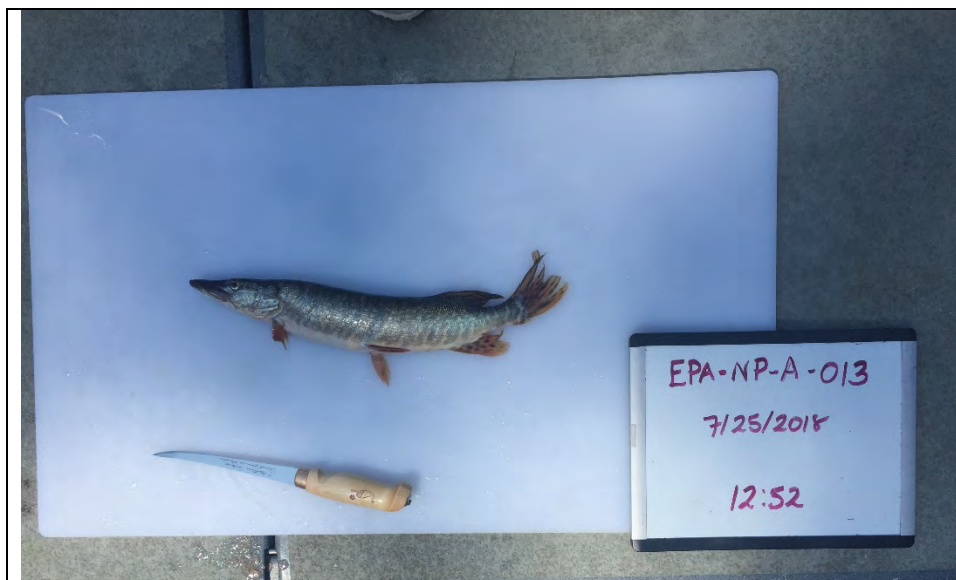
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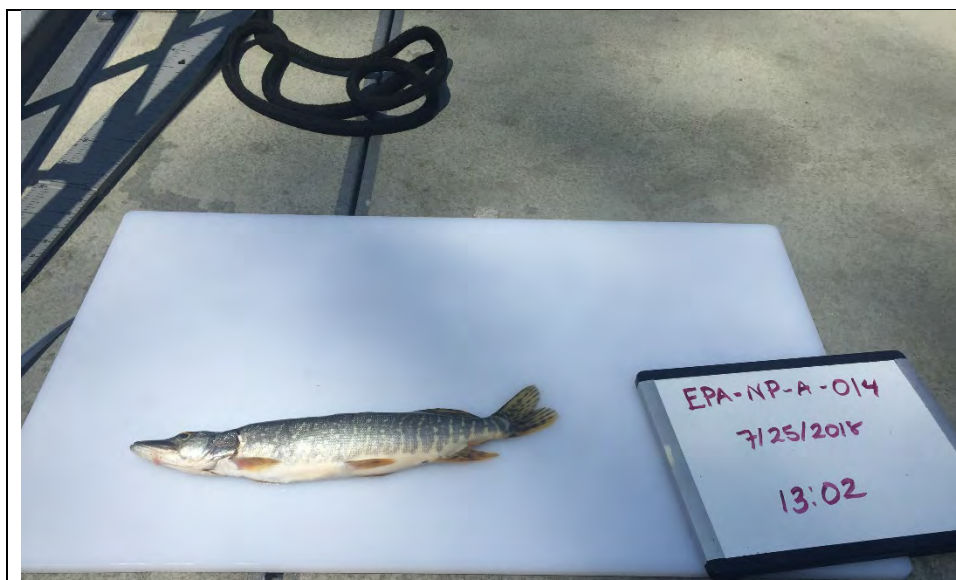
EPA-NP-B-013



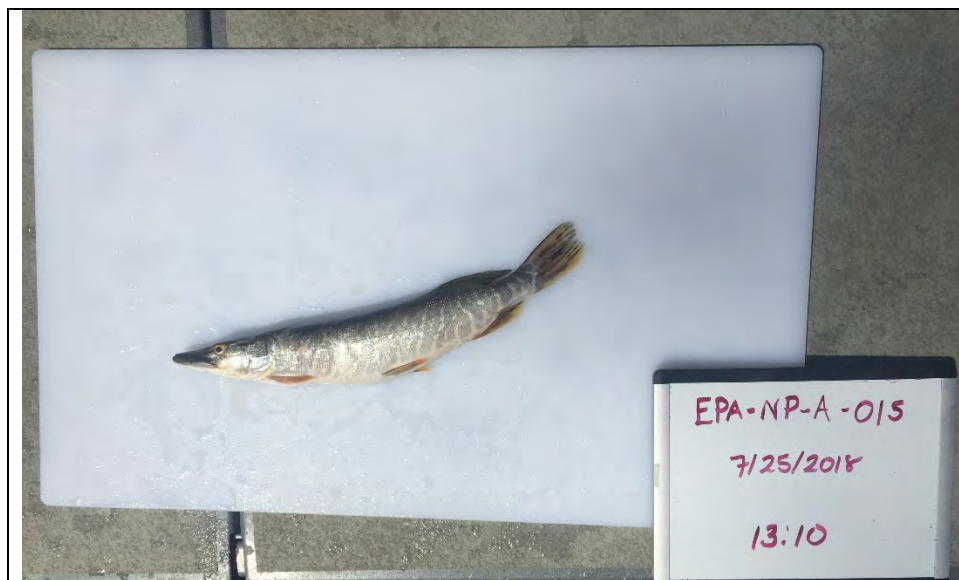
EPA-NP-A-012



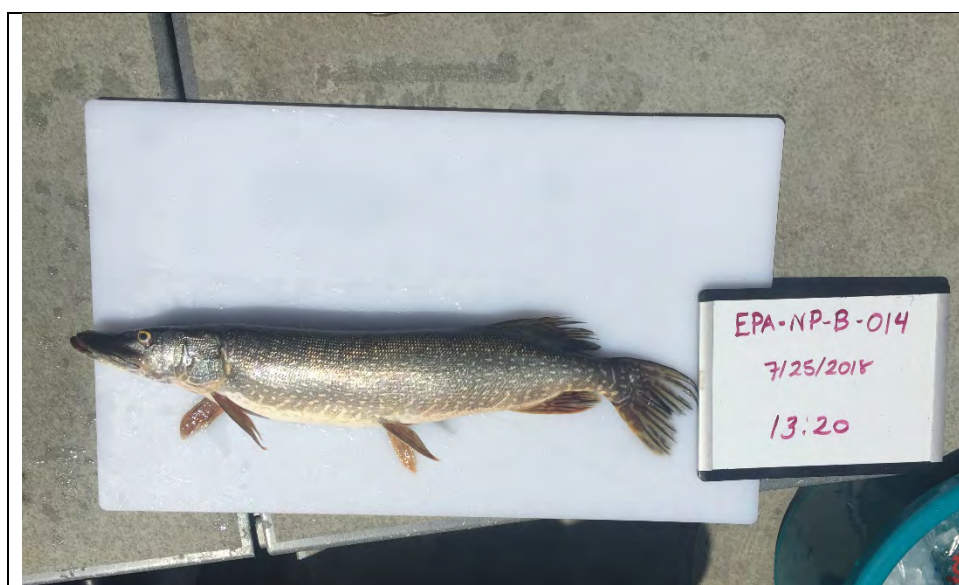
EPA-NP-A-013



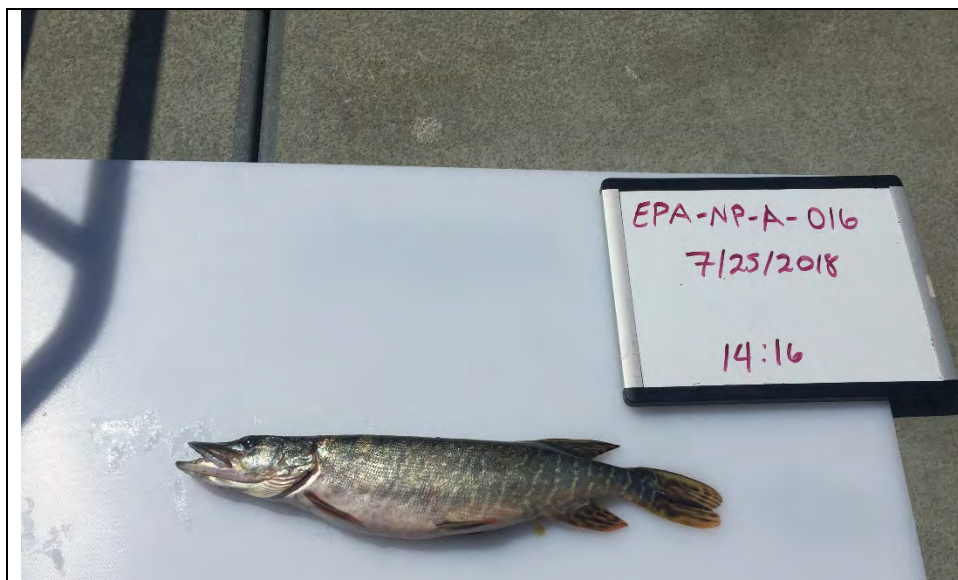
EPA-NP-A-014



EPA-NP-A-015



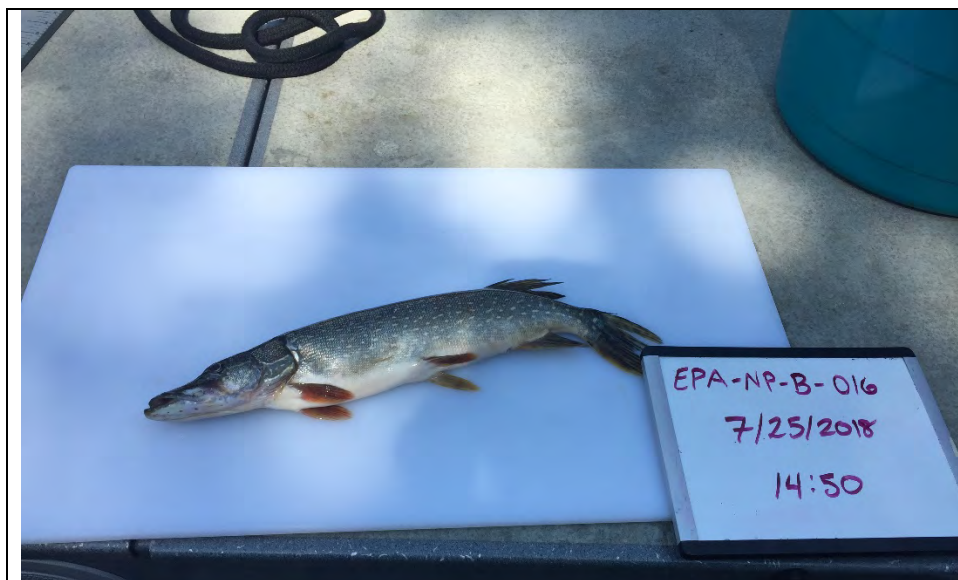
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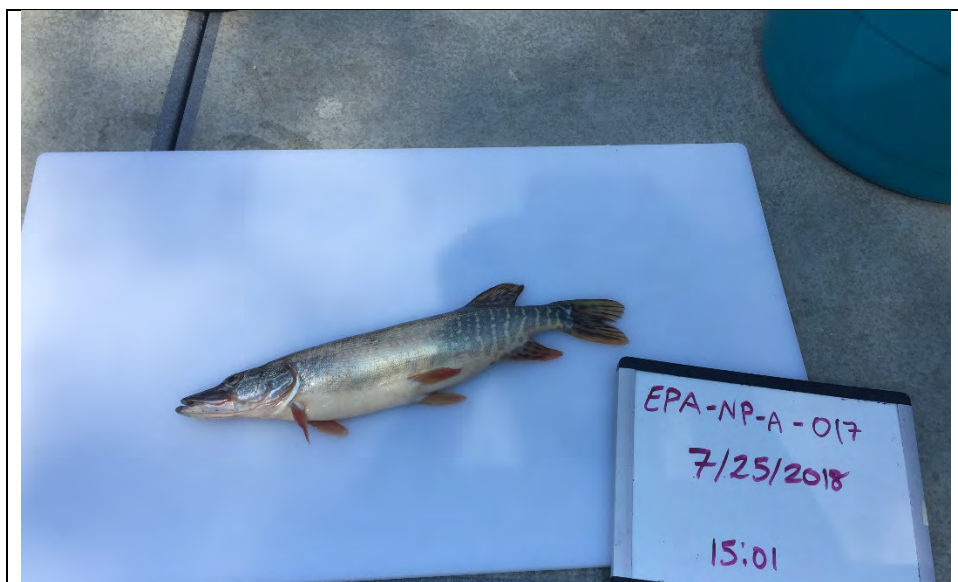
EPA-NP-A-016



EPA-NP-B-015



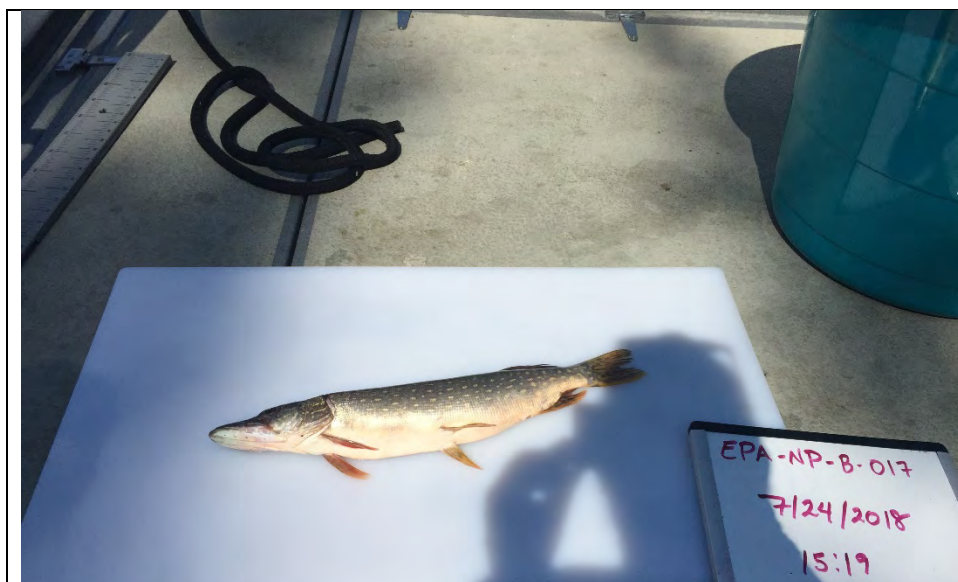
EPA-NP-B-016



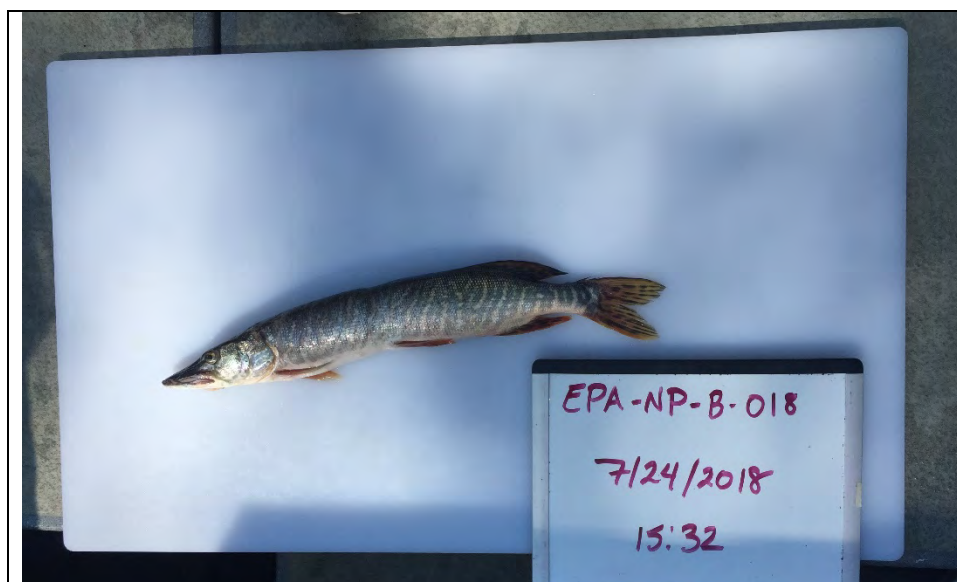
EPA-NP-A-017



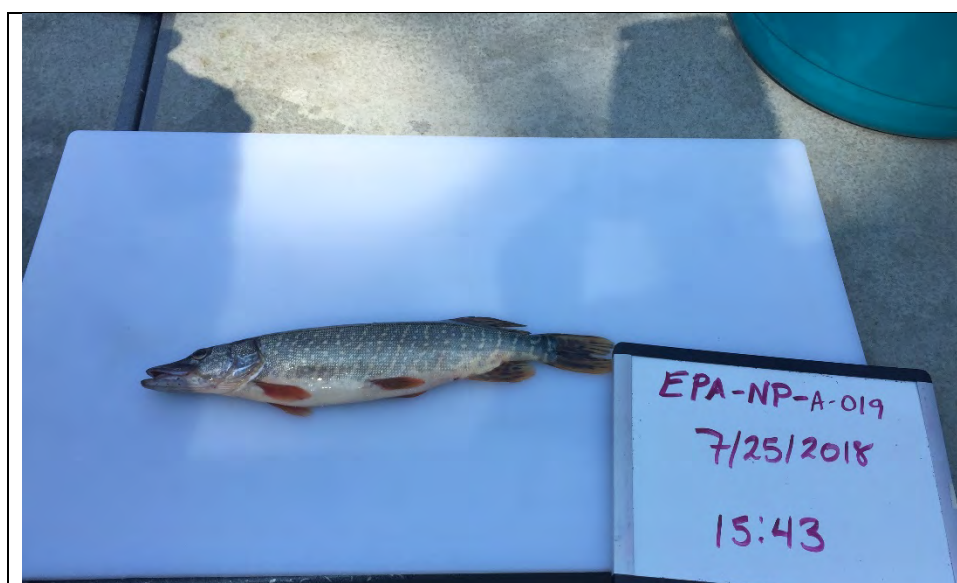
EPA-NP-A-018



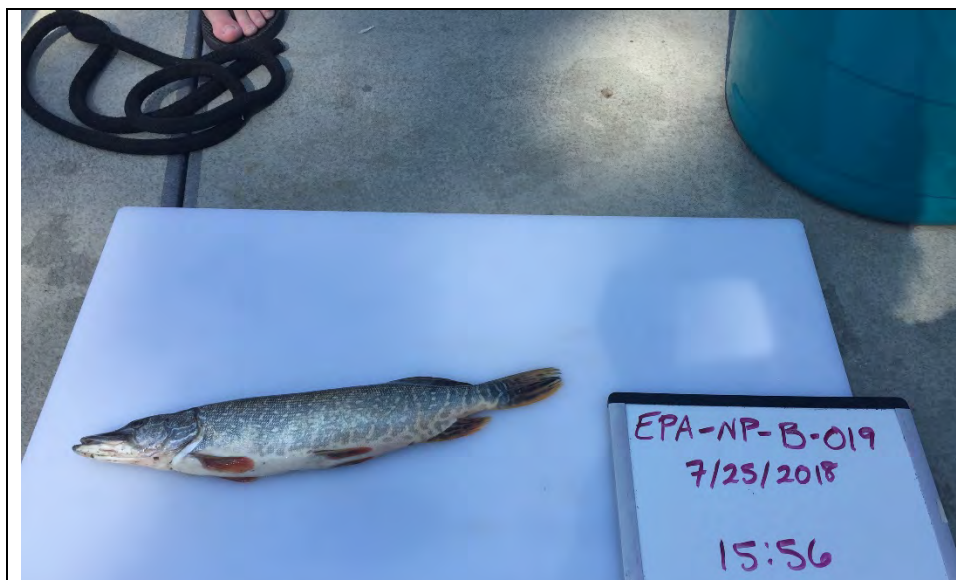
EPA-NP-B-017



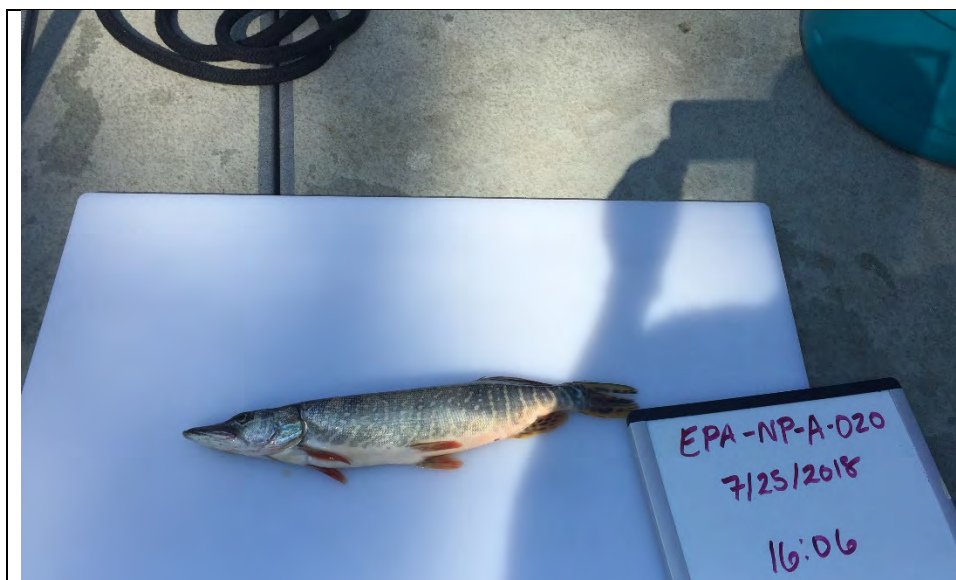
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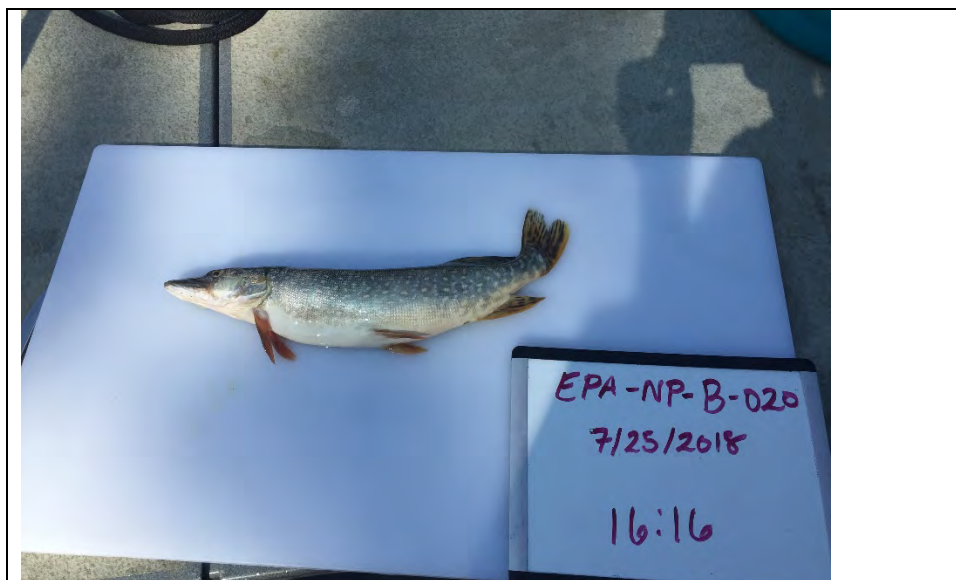
EPA-NP-A-019



EPA-NP-B-019



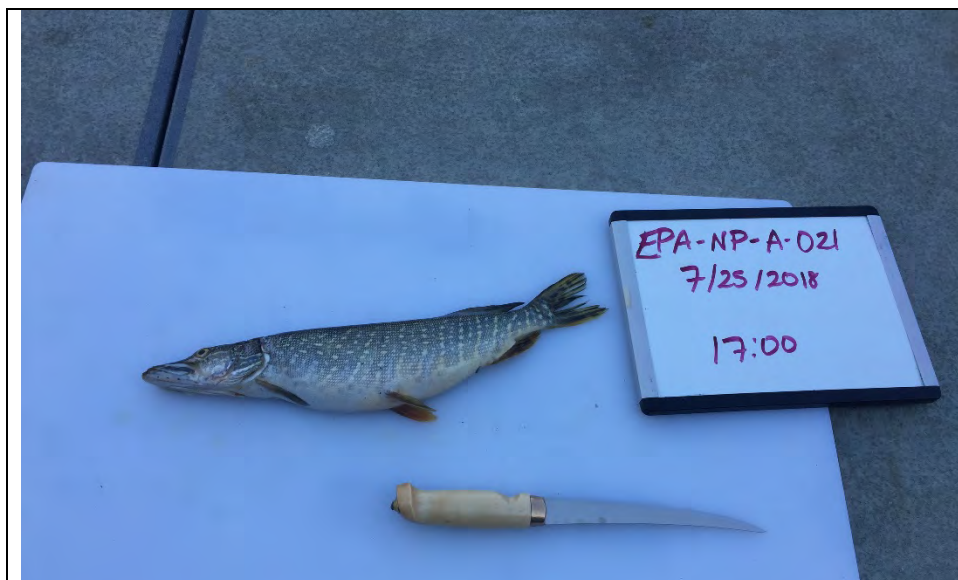
EPA-NP-A-020



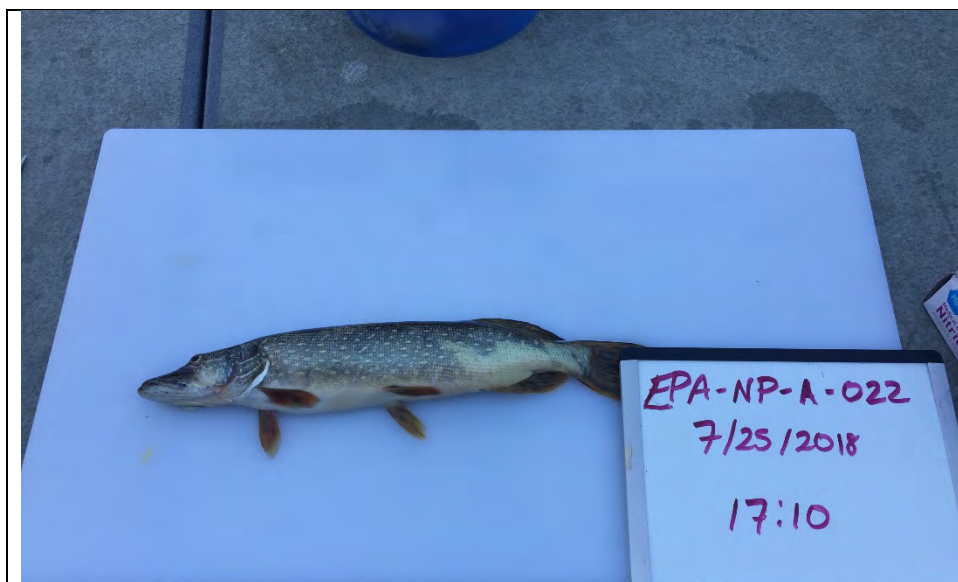
EPA-NP-B-020



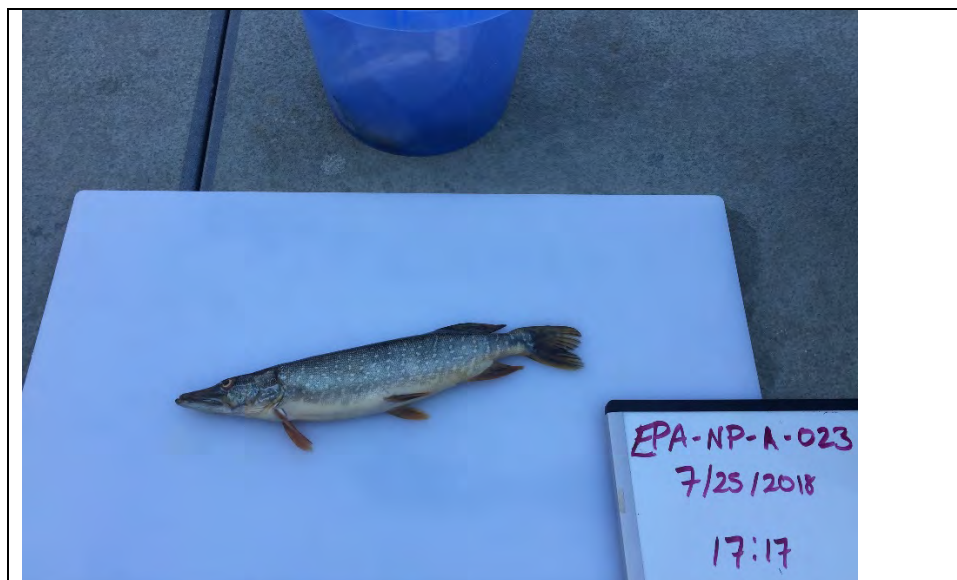
EPA-NP-B-021



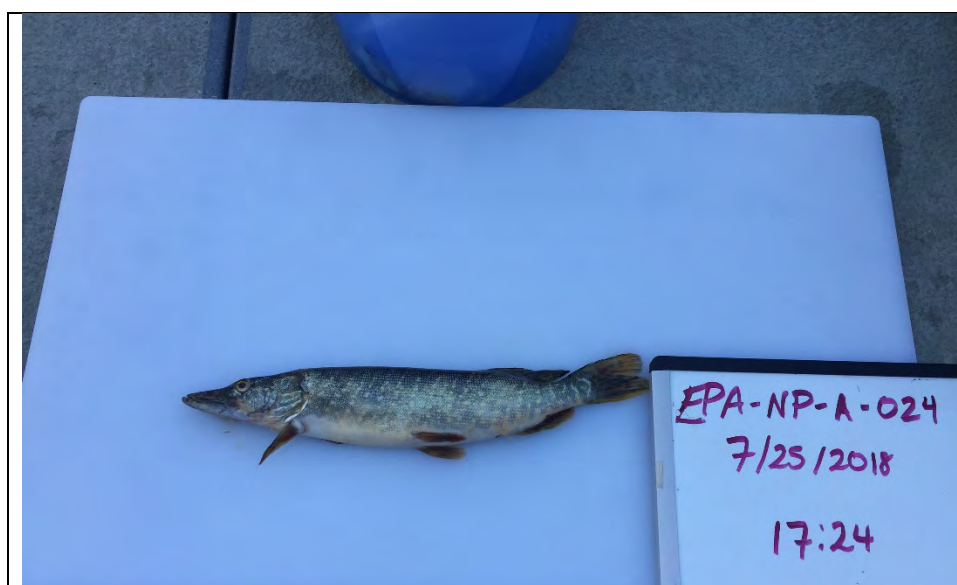
EPA-NP-A-021



EPA-NP-A-022



EPA-NP-A-023



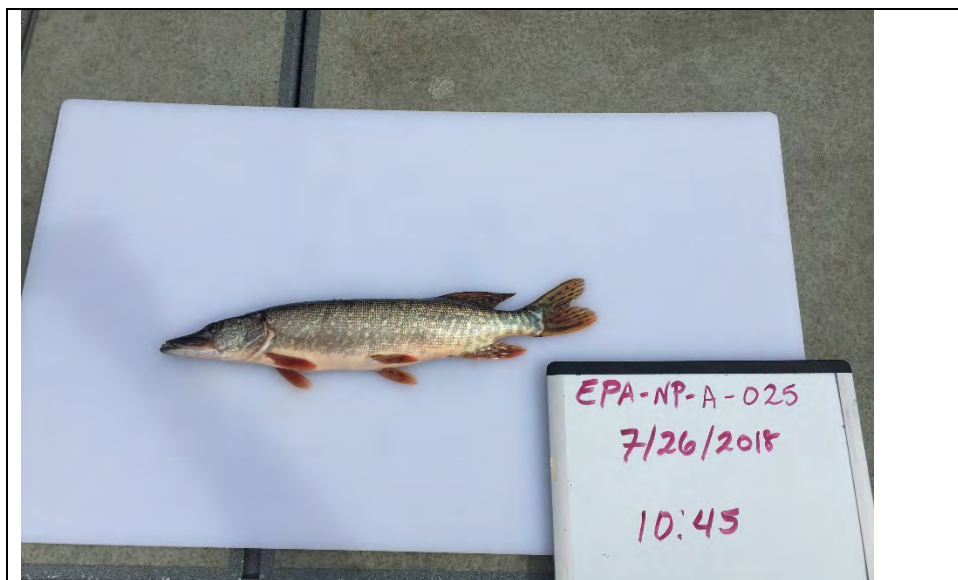
EPA-NP-A-024



EPA-NP-B-022



EPA-NP-B-023



EPA-NP-A-025



EPA-NP-A-026



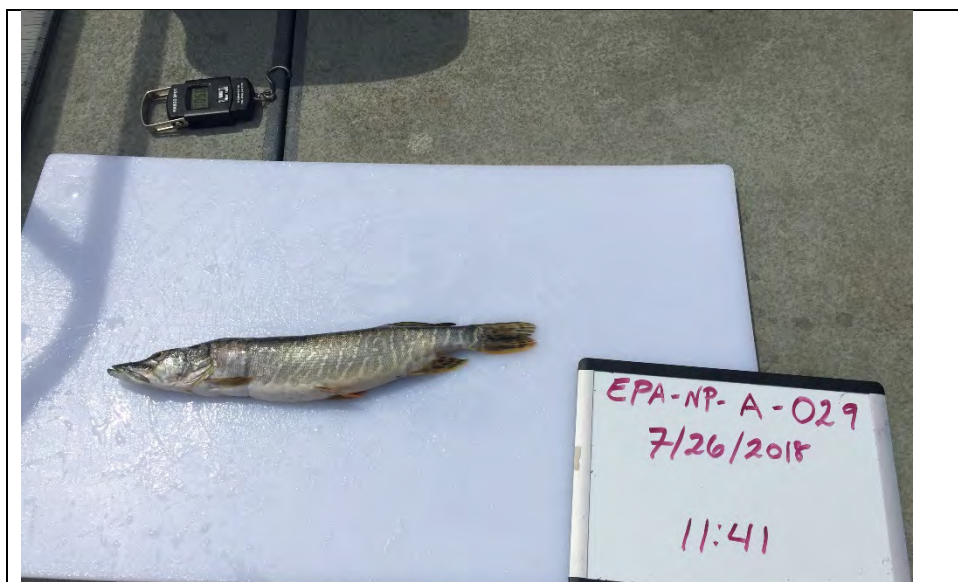
EPA-NP-A-026 – vole found in stomach



EPA-NP-A-027



EPA-NP-A-028



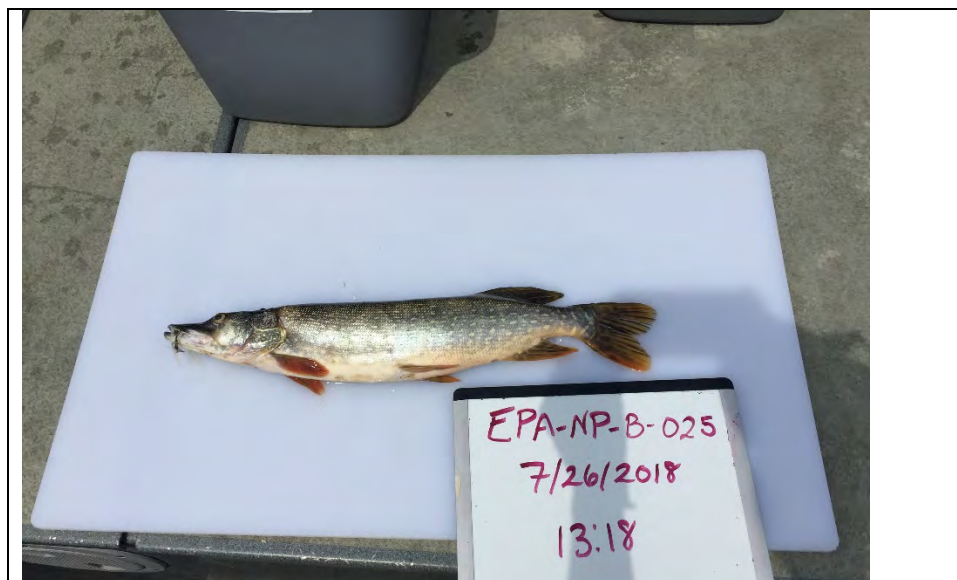
EPA-NP-A-029



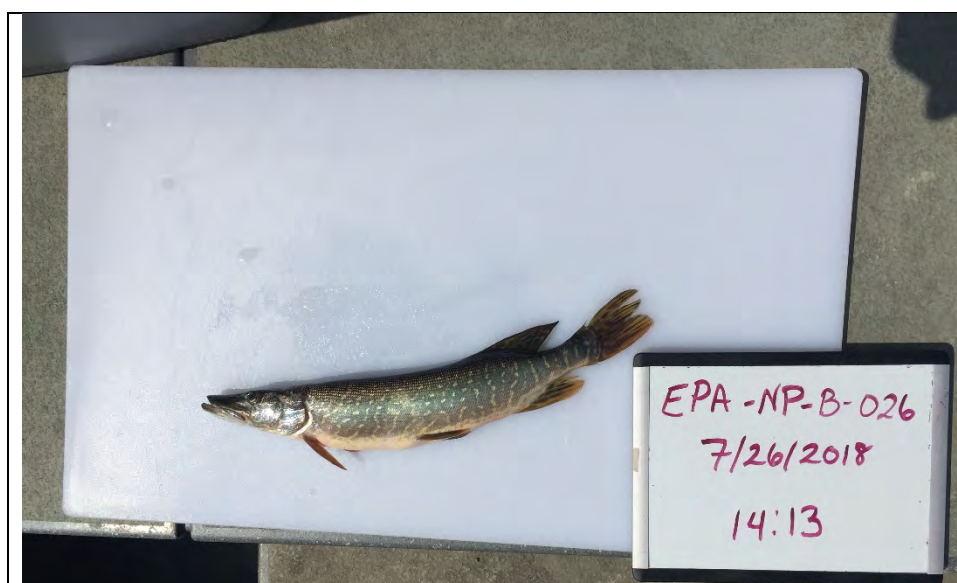
EPA-NP-A-030



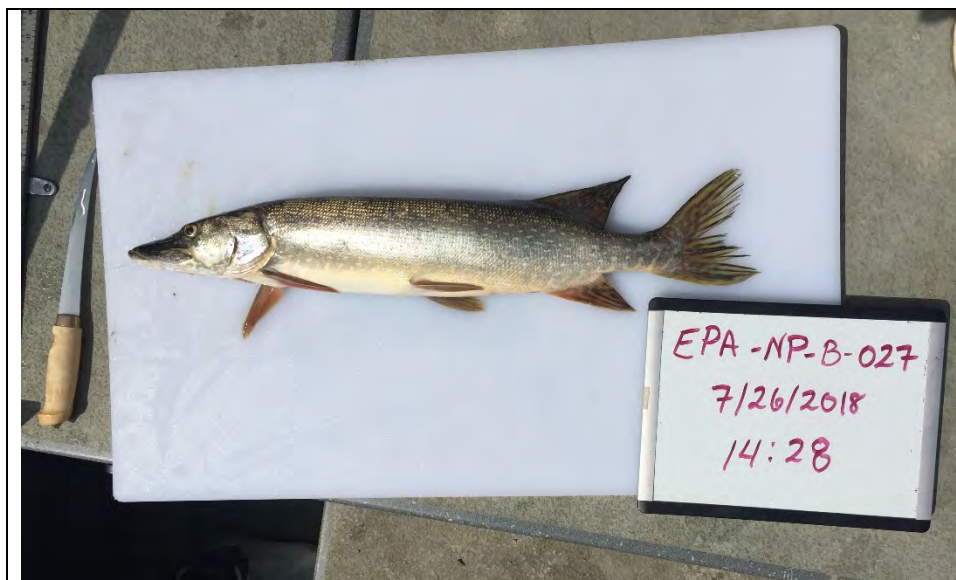
EPA-NP-B-024



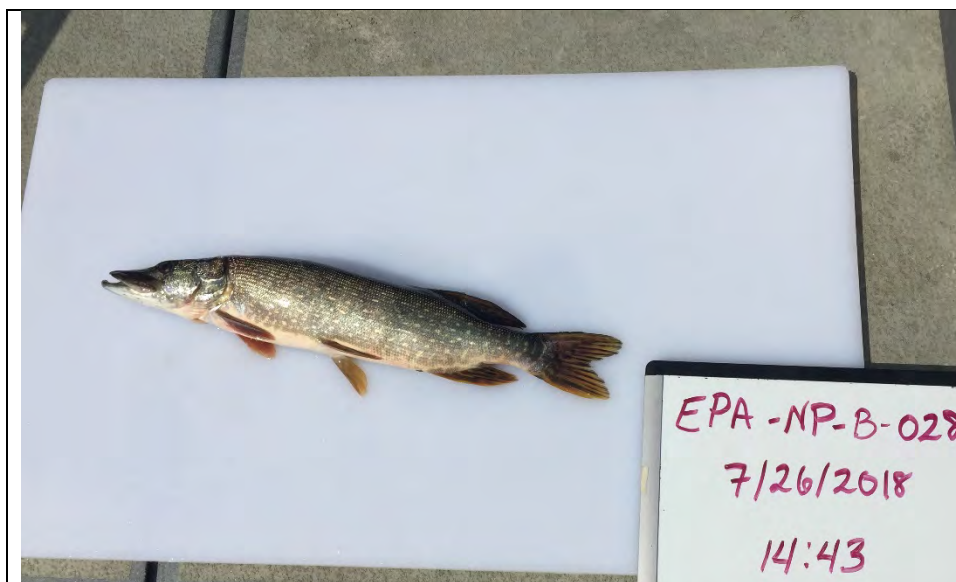
EPA-NP-B-025



EPA-NP-B-026



EPA-NP-B-027



EPA-NP-B-028



EPA-NP-B-029



EPA-NP-B-030

Appendix B

Field Forms

2018 Fish Collection Form

Upper Columbia River (UCR) Northern Pike Tissue Study

Date:

7/24/2018

Individual Fish ID	Time	Abnormalities (V)	Photo ID	Weight of Fillets (g)	Collectors Initials	Notes: W = Weight (g) L = Length (mm)
~~EPA-NP-A-001~~	10:08	None		100	K10 J4	L = 375 mm W = 350 g 48.63147, -118.08023
EPA-NP-A-002	10:30	None		~~100~~ 136 g	K10 J4	L = 445 mm W = 590 g 48.63147, -118.08023
EPA-NP-A-003	10:53	None		95 g	K10 J4	L = 410 mm W = 495 g 48.65766, -118.10988
EPA-NP-B-000	11:20	None		2100 g	K10 J4	L = 660 mm W = 2275 g 48.65706, -118.10988
EPA-NP-B-002	11:39	None		180 g	K10 J4	L = 460 mm W = 655 g 48.65320, -118.11044
EPA-NP-A-004	11:52	None		140 g	K10, J4	L = 445 mm W = 605 g 48.65320, -118.11044
EPA-NP-B-003	12:15	None		1130 g	K10 J4	L = 1070 mm W = 780 g 48.66515, -118.06994
EPA-NP-B-004	13:00	None		160	K10, J4	L = 460 mm W = 645 g 48.66515, -118.06994
EPA-NP-A-005	13:43	None		100	K10, J4	L = 449 mm W = 600 g 48.65053, -118.07862
EPA-NP-A-006	13:50	None		120	K10 J4	L = 445 mm W = 555 g 48.65053, -118.07862

2018 Fish Collection Form

Date: 7/24/2018

Upper Columbia River (UCR) Northern Pike Tissue Study

Individual Fish ID	Time	Abnormalities (V)	Photo ID	Weight of Fillets (g)	Collectors Initials	Notes: $W = \text{weight (g)}$ $L = \text{length (mm)}$
EPA-NP-A-007	14:07	None		135g	K10, J11	$W = 595$ $L = 440 \text{ mm}$ $48.62952, -118.07698$
EPA-NP-B-005	14:20	None		165g	K10, J11	$W = 630g$ $L = 455 \text{ mm}$ $48.62952, -118.07698$
EPA-NP-B-006	14:38	None		165g	K10, J11	$W = 650g$ $L = 455 \text{ mm}$ $48.62952, -118.07698$
EPA-NP-A-008	14:56	None		120g	K10, J11	$W = 495$ $L = 440 \text{ mm}$ $48.62952, -118.07698$
EPA-NP-B-007	15:14	None		890g	K10, J11	$W = 2540g$ $L = 700 \text{ mm}$ $48.68369, -118.07938$
EPA-NP-A-009	15:30	None		115g	K10, J11	$W = 350g$ $L = 380 \text{ mm}$ $48.68369, -118.07938$
EPA-NP-A-D10	15:36	None		130g	K10, J11	$W = 500g$ $L = 410 \text{ mm}$ $48.68369, -118.07938$
EPA-NP-B-008	15:49	None		135g	K10, J11	$W = 635g$ $L = 455$ $48.68319, -118.07943$
EPA-NP-D-009	16:00	None		180g	K10, J11	$W = 705$ $L = 465$ $48.68319, -118.07943$
EPA-NP-B-010	16:13	None		620g	K10, J11	$W = 3210$ $L = 750$ $48.69331, -118.01560$

Date: 4/24/2018

7/24/2018

$w = 2445$
 $L = 710 \text{ mm}$
 $48.69331, -118.01560$

2018 Fish Collection Form
Upper Columbia River (UCR) Northern Pike Tissue Study

Date: 7/25/2018

Individual Fish ID	Time	Abnormalities (V)	Photo ID	Weight of Fillets (g)	Collectors Initials	Notes: $W < \text{weight}$ $L = \text{length}$
EPA-NP-B-012	10:01	None		125	K10, JY	L = 450mm W = 490g 48.62930, -118.07656
EPA-NP-A-011	11:00	None		160	K10, JY	L = 445mm W = 600g 48.62643, -118.07375
EPA-NP-B-013	12:24	None		175	K10, JY	L = 465mm W = 755g 48.68350, -118.07941
EPA-NP-A-012	12:37	None		160	K10, JY	L = 425mm W = 585g 48.68350, -118.07941
EPA-NP-A-013	12:52	None		90	K10, JY	L = 395mm W = 375g 48.68350, -118.07941
EPA-NP-A-014	13:02	None		75	K10, JY	L = 375mm W = 340g 48.68350, -118.07941
EPA-NP-A-015	13:10	None		170	K10, JY	L = 425mm W = 510g 48.68350, -118.07941
EPA-NP-B-014	13:20	None		490	K10, JY	L = 710mm W = 2340g 48.68350, -118.07941
EPA-NP-A-016	14:16	None		95	K10, JY	L = 410mm W = 545g 48.68385, -118.08244
EPA-NP-B-015	14:35	None		140	K10, JY	L = 506mm W = 835g 48.66355, -118.07326

2018 Fish Collection Form

Date:

7/25/2018

Upper Columbia River (UCR) Northern Pike Tissue Study

Individual Fish ID	Time	Abnormalities (V)	Photo ID	Weight of Fillets (g)	Collectors Initials	Notes: W = weight L = Length
EPA-NP-B-016	14:50	None		210g	K10, SY	L = 500mm W = 835g 48.6658, -118.06999
EPA-NP-A-017	15:01	None		110	K10, SY	L = 440 W = 480 48.62167, -118.07317
EPA-NP-A-018	15:11	None		95	K10, SY	L = 370 W = 250g 48.62167, -118.07317
EPA-NP-B-017	15:19	None		165	K10, SY	L = 480mm W = 730g 48.62006, -118.07358
EPA-NP-B-018	15:32	None		115	K10, SY	L = 460mm W = 545g 48.62006, -118.07358
EPA-NP-B-019	15:43	None		95	K10, SY	L = 410mm W = 425g 48.61752, -118.09050
EPA-NP-B-019	15:56	None		195	K10, SY	L = 450mm W = 590g 48.61752, -118.09050
EPA-NP-A-020	16:06	None		110	K10, SY	L = 430 W = 525 48.64663, -118.08147
EPA-NP-B-020	16:16	None		150	K10, SY	L = 455mm W = 700g 48.64663, -118.08147
EPA-NP-B-021	16:30	None		180	K10, SY	L = 495mm W = 890g 48.57411, -118.09495

Date: 7/25/2018

Upper Columbia River (UCR) Northern Pike Tissue Study

[illegible]

2018 Fish Collection Form

Date:

7/26/2018

Upper Columbia River (UCR) Northern Pike Tissue Study

Individual Fish ID	Time	Abnormalities (V)	Photo ID	Weight of Fillets (g)	Collectors Initials	Notes: L = length (mm) W = weight (g)
EPA-NP-B-022	9:26	None		165g	K10, J4	L = 500mm W = 890g 48.66612, -118.06889
EPA-NP-B-023	9:40	None		145	K10, J4	L = 465mm W = 670g 48.66612, -118.06889
EPA-NP-A-025	10:45	None		90	K10, J4	L = 420mm W = 495g 48.68360, -118.07849
EPA-NP-A-026	10:57	None		140	K10, J4	L = 440mm W = 525g 48.68376, -118.08071
EPA-NP-A-027	11:11	None/eye ^L		90	K10, J4	L = 449mm W = 495g 48.68376, -118.08071
EPA-NP-A-028	11:27	Frayed fins		110	K10, J4	L = 410 W = 440 48.68376, -118.08071
EPA-NP-A-029	11:41	Frayed fins, mild		105	K10, J4	~~48.68376, -118.08071~~ 48.68368, -118.07947
EPA-NP-A-030	12:30	Frayed fins		130	K10, J4	~~48.68376, -118.08071~~ 48.68353, -118.08205
EPA-NP-B-024	12:50	None		125	K10, J4	L = 475mm W = 715g 48.65296, -118.08488
EPA-NP-B-025	13:18	None		220	K10, J4	L = 525mm W = 1015g 48.57335, -118.08826

2018 Fish Collection Form

Upper Columbia River (UCR) Northern Pike Tissue Study

Date: 7/26/2018

Individual Fish ID	Time	Abnormalities (V)	Photo ID	Weight of Fillets (g)	Collectors Initials	L = length (mm) Notes: W = weight (g)
EPA-NP-B-026	14:13	frayed fins		110	K10, JY	L = 460mm W = 660g 48.57335, -118.08826
EPA-NP-B-027	14:28	mild fraying in fins		350	K10, JY	L = 660mm W = 1890g 48.57401, -118.09178
EPA-NP-B-028	14:43	eyes		150	K10, JY	L = 465mm W = 650g 48.57434, -118.09444
EPA-NP-B-029	15:06	frayed fins		285	K10, JY	L = 615mm W = 1560g 48.65262, -118.11034
EPA-NP-B-030	15:21	None		130	K10, JY	L = 505mm W = 775g 48.57386, -118.08707

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/24/2018 ^{KID} Reach: _____ Indiv. Fish Sample No. EPA-NP-A-001

Time: 10:06 Weight (g): 350g Length ^{mm} (cm): 375

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border: none;">Left</th> <th style="text-align: left; border: none;">Right</th> </tr> <tr> <td style="border: none;">☒ normal</td> <td style="border: none;">☒ normal</td> </tr> <tr> <td style="border: none;">☐ exophthalmic</td> <td style="border: none;">☐ exophthalmic</td> </tr> <tr> <td style="border: none;">☐ opaque</td> <td style="border: none;">☐ opaque</td> </tr> <tr> <td style="border: none;">☐ missing</td> <td style="border: none;">☐ missing</td> </tr> <tr> <td style="border: none;">☐ hemorrhagic</td> <td style="border: none;">☐ hemorrhagic</td> </tr> <tr> <td style="border: none;">☐ emboli</td> <td style="border: none;">☐ emboli</td> </tr> <tr> <td style="border: none;">☐ other(specify): _____</td> <td style="border: none;">☐ other(specify): _____</td> </tr> <tr> <td style="border: none;">_____</td> <td style="border: none;">_____</td> </tr> <tr> <td style="border: none;">_____</td> <td style="border: none;">_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____
Left	Right																					
☒ normal	☒ normal																					
☐ exophthalmic	☐ exophthalmic																					
☐ opaque	☐ opaque																					
☐ missing	☐ missing																					
☐ hemorrhagic	☐ hemorrhagic																					
☐ emboli	☐ emboli																					
☐ other(specify): _____	☐ other(specify): _____																					
_____	_____																					
_____	_____																					

OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____

GILLS: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border: none;">Left:</th> <th style="text-align: left; border: none;">Right:</th> </tr> <tr> <td style="border: none;">☒ normal</td> <td style="border: none;">☒ normal</td> </tr> <tr> <td style="border: none;">☐ frayed</td> <td style="border: none;">☐ frayed</td> </tr> <tr> <td style="border: none;">☐ marginate</td> <td style="border: none;">☐ marginate</td> </tr> <tr> <td style="border: none;">☐ pale</td> <td style="border: none;">☐ pale</td> </tr> <tr> <td style="border: none;">☐ other (specify): _____</td> <td style="border: none;">☐ other (specify): _____</td> </tr> </table>	Left:	Right:	☒ normal	☒ normal	☐ frayed	☐ frayed	☐ marginate	☐ marginate	☐ pale	☐ pale	☐ other (specify): _____	☐ other (specify): _____	DELTS: ☐ Deformities ☐ Erosion ☐ Lesions ☐ Tumors
Left:	Right:												
☒ normal	☒ normal												
☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/24/2018 ^{KID} 7/23/18 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-002

Time: 10:30 Weight (g): 590 Length (^{mm}cm): 445

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td>☐ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☒ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> </table> <u>likely to kill</u> <u>below</u>	Left	Right	☐ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☒ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____
Left	Right																	
☐ normal	☒ normal																	
☐ exophthalmic	☐ exophthalmic																	
☐ opaque	☐ opaque																	
☒ missing	☐ missing																	
☐ hemorrhagic	☐ hemorrhagic																	
☐ emboli	☐ emboli																	
☐ other(specify): _____	☐ other(specify): _____																	

OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____

GILLS: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left:</th> <th style="text-align: left; border-bottom: 1px solid black;">Right:</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ frayed</td> <td>☐ frayed</td> </tr> <tr> <td>☐ marginate</td> <td>☐ marginate</td> </tr> <tr> <td>☐ pale</td> <td>☐ pale</td> </tr> <tr> <td>☐ other (specify): _____</td> <td>☐ other (specify): _____</td> </tr> </table>	Left:	Right:	☒ normal	☒ normal	☐ frayed	☐ frayed	☐ marginate	☐ marginate	☐ pale	☐ pale	☐ other (specify): _____	☐ other (specify): _____	DELTS: ☐ Deformities ☐ Erosion ☐ Lesions ☐ Tumors
Left:	Right:												
☒ normal	☒ normal												
☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/24/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-003

Time: 10:53 Weight (g): 495 Length (mm): 410 mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border: none;">Left</th> <th style="text-align: left; border: none;">Right</th> </tr> <tr> <td style="border: none;">☒ normal</td> <td style="border: none;">☒ normal</td> </tr> <tr> <td style="border: none;">☐ exophthalmic</td> <td style="border: none;">☐ exophthalmic</td> </tr> <tr> <td style="border: none;">☐ opaque</td> <td style="border: none;">☐ opaque</td> </tr> <tr> <td style="border: none;">☐ missing</td> <td style="border: none;">☐ missing</td> </tr> <tr> <td style="border: none;">☐ hemorrhagic</td> <td style="border: none;">☐ hemorrhagic</td> </tr> <tr> <td style="border: none;">☐ emboli</td> <td style="border: none;">☐ emboli</td> </tr> <tr> <td style="border: none;">☐ other(specify):</td> <td style="border: none;">☐ other(specify):</td> </tr> <tr> <td style="border: none;"> </td> <td style="border: none;"> </td> </tr> <tr> <td style="border: none;"> </td> <td style="border: none;"> </td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):				
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☐ emboli	☐ emboli																					
☐ other(specify):	☐ other(specify):																					

OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____

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☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/24/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-001

Time: 11:20 Weight (g): 2275 Length (mm): 660

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): ☐ white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): _____ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____ _____	EYES: <table style="width:100%;"> <tr> <th style="text-align: left;">Left</th> <th style="text-align: left;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____
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☐ other(specify): _____	☐ other(specify): _____																					
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____

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☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/24/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B 002

Time: 11:39 Weight (g): 1055 Length (^{mm}cm): 460

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify):</td> <td>☐ other(specify):</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):	_____	_____	_____	_____	_____	_____
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____

GILLS: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left:</th> <th style="text-align: left; width: 50%;">Right:</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ frayed</td> <td>☐ frayed</td> </tr> <tr> <td>☐ marginate</td> <td>☐ marginate</td> </tr> <tr> <td>☐ pale</td> <td>☐ pale</td> </tr> <tr> <td>☐ other (specify): _____</td> <td>☐ other (specify): _____</td> </tr> </table>	Left:	Right:	☒ normal	☒ normal	☐ frayed	☐ frayed	☐ marginate	☐ marginate	☐ pale	☐ pale	☐ other (specify): _____	☐ other (specify): _____	DELTS: ☐ Deformities ☐ Erosion ☐ Lesions ☐ Tumors
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☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/24/2010 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-004

Time: 11:52 Weight (g): 1005 Length (cm): 445 mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border: none;">Left</th> <th style="text-align: left; border: none;">Right</th> </tr> <tr> <td style="border: none;">☒ normal</td> <td style="border: none;">☒ normal</td> </tr> <tr> <td style="border: none;">☐ exophthalmic</td> <td style="border: none;">☐ exophthalmic</td> </tr> <tr> <td style="border: none;">☐ opaque</td> <td style="border: none;">☐ opaque</td> </tr> <tr> <td style="border: none;">☐ missing</td> <td style="border: none;">☐ missing</td> </tr> <tr> <td style="border: none;">☐ hemorrhagic</td> <td style="border: none;">☐ hemorrhagic</td> </tr> <tr> <td style="border: none;">☐ emboli</td> <td style="border: none;">☐ emboli</td> </tr> <tr> <td style="border: none;">☐ other(specify): _____</td> <td style="border: none;">☐ other(specify): _____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____
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☐ other(specify): _____	☐ other(specify): _____																	

OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____

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☒ normal	☒ normal												
☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☐ normal ☐ mild erosion ☐ severe erosion ☒ frayed, mild	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/24/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-003

Time: 12:15 Weight (g): 7830 Length (cm): 1070 mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____

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☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/24/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-004

Time: 13:00 Weight (g): 1045 Length (cm): 460 mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots leech(es) black spot(s) Anchor worm(s) other (specify):	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify):</td> <td>☐ other(specify):</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):						
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____ _____

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☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____ _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/24/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-005

Time: 1343 Weight (g): 600 Length ^{mm}(cm): 449

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____
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☐ hemorrhagic	☐ hemorrhagic																					
☐ emboli	☐ emboli																					
☐ other(specify): _____	☐ other(specify): _____																					
_____	_____																					
_____	_____																					

OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____

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☐ other (specify): _____	☐ other (specify): _____												

FINS: ☐ normal ☐ mild erosion ☐ severe erosion ☒ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/24/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-006

Time: 13:56 Weight (g): 555g Length (cm): ^{mm}445 mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): ☐ white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): _____ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: K10 ☒ normal no barbel ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____ _____	EYES: <table style="width:100%;"> <tr> <th style="text-align: left;">Left</th> <th style="text-align: left;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____
Left	Right																					
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☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/24/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-007

Time: 14:07 Weight (g): 595 Length (cm): ^{mm}440 mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%;"> <tr> <th style="text-align: left;">Left</th> <th style="text-align: left;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify):</td> <td>☐ other(specify):</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):	_____	_____	_____	_____	_____	_____
Left	Right																							
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____

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☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/24/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-005

Time: 14:20 Weight (g): 630 Length (^{mm}cm): 455mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td style="vertical-align: top; border-right: 1px solid black; padding: 5px;"> ☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): _____ _____ _____ </td> <td style="vertical-align: top; padding: 5px;"> ☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): _____ _____ _____ </td> </tr> </table>	Left	Right	☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): _____ _____ _____	☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): _____ _____ _____
Left	Right					
☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): _____ _____ _____	☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): _____ _____ _____					

OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____

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Left:	Right:				
☒ normal ☐ frayed ☐ marginate ☐ pale ☐ other (specify): _____	☒ normal ☐ frayed ☐ marginate ☐ pale ☐ other (specify): _____				

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/24/2018 ^{7/23/2018} Reach: _____ Indiv. Fish Sample No. EPA-NP-B-006

Time: 14:38 Weight (g): 690 Length (mm): 455

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____

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☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/24/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-008

Time: 14:56 Weight (g): 495 Length (cm): ^{mm}440

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border: none;">Left</th> <th style="text-align: left; border: none;">Right</th> </tr> <tr> <td style="border: none; vertical-align: top;"> ☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): _____ _____ _____ </td> <td style="border: none; vertical-align: top;"> ☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): _____ _____ _____ </td> </tr> </table>	Left	Right	☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): _____ _____ _____	☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): _____ _____ _____
Left	Right					
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____

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Left:	Right:				
☒ normal ☐ frayed ☐ marginate ☐ pale ☐ other (specify): _____	☒ normal ☐ frayed ☐ marginate ☐ pale ☐ other (specify): _____				

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/24/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-007

Time: 15:14 Weight (g): 2540g Length (cm): ^{mm}700

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____
Left	Right																					
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☐ missing	☐ missing																					
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☐ other(specify): _____	☐ other(specify): _____																					
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____

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☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/24/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-009

Time: 15:30 Weight (g): 350g Length (mm): 380mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____
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☐ emboli	☐ emboli																					
☐ other(specify): _____	☐ other(specify): _____																					
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____

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FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/24/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-010

Time: 15:36 Weight (g): 500 Length (cm): ^{mm}410

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%;"> <tr> <th style="text-align: left;">Left</th> <th style="text-align: left;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify):</td> <td>☐ other(specify):</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):	_____	_____	_____	_____
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FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/24/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-008

Time: 15:49 Weight (g): 635g Length (mm): 455

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening ☐ Other (specify): _____ _____ _____

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FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed ☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/24/2018 Reach: _____ Indiv. Fish Sample No. EPA - NP-B-009

Time: 14:00 Weight (g): 705 Length (cm): 465

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____

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☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/24/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-010

Time: 16:13 Weight (g): 3210 Length ^{mm}(cm): 750

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots leech(es) black spot(s) Anchor worm(s) other (specify): 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify):</td> <td>☐ other(specify):</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):	_____	_____	_____	_____	_____	_____
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____ _____

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FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/24/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-011

Time: 16:26 Weight (g): 2445 Length ^{mm}(cm): 710

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots leech(es) black spot(s) Anchor worm(s) other (specify): 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify):</td> <td>☐ other(specify):</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):	_____	_____	_____	_____	_____	_____
Left	Right																							
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____ _____

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☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-012

Time: 10:01 Weight (g): 490 Length ^{mm}(cm): 450

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____ _____	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____
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FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/25/2016 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-011

Time: 11:00 Weight (g): 600 Length ^{mm} (cm): 445

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____ _____	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____	_____	_____
Left	Right																							
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☐ missing	☐ missing																							
☐ hemorrhagic	☐ hemorrhagic																							
☐ emboli	☐ emboli																							
☐ other(specify): _____	☐ other(specify): _____																							
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____ _____

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Left:	Right:												
☒ normal	☒ normal												
☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-013

Time: 12:24 Weight (g): 755 Length (cm): 465

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots leech(es) black spot(s) Anchor worm(s) other (specify): ☐ ☐ ☐ ☐ ☐ 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: Left ☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): Right ☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify):

OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____

GILLS: Left: ☒ normal ☐ frayed ☐ marginate ☐ pale ☐ other (specify): _____ Right: ☒ normal ☐ frayed ☐ marginate ☐ pale ☐ other (specify): _____	DELTS: ☐ Deformities ☐ Erosion ☐ Lesions ☐ Tumors

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-012

Time: 12:37 Weight (g): 585g Length (mm): 425mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots leech(es) black spot(s) Anchor worm(s) other (specify): 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____ _____</td> <td>☐ other(specify): _____ _____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____ _____	☐ other(specify): _____ _____
Left	Right																	
☒ normal	☒ normal																	
☐ exophthalmic	☐ exophthalmic																	
☐ opaque	☐ opaque																	
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☐ hemorrhagic	☐ hemorrhagic																	
☐ emboli	☐ emboli																	
☐ other(specify): _____ _____	☐ other(specify): _____ _____																	

OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____

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Left:	Right:												
☒ normal	☒ normal												
☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-013

Time: 12:52 Weight (g): 375 Length (cm): 395^{mm}

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____
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☐ hemorrhagic	☐ hemorrhagic																	
☐ emboli	☐ emboli																	
☐ other(specify): _____	☐ other(specify): _____																	

OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____

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Left:	Right:												
☒ normal	☒ normal												
☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☒ other (specify): <u>damage from gill net</u>

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-014

Time: 13:02 Weight (g): 340 Length (mm): 375

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots leech(es) black spot(s) Anchor worm(s) other (specify): 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify):</td> <td>☐ other(specify):</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):	_____	_____	_____	_____	_____	_____
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____

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☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

7/25/2018

Date (MM/DD/YYYY): EPA-NP-A-015 Reach: K10 Indiv. Fish Sample No. EPA-NP-A-015

Time: 13:40 Weight (g): 510 Length (mm): 425 mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify):</td> <td>☐ other(specify):</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):						
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify):

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☐ other (specify):	☐ other (specify):														

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify):

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-014

Time: 13:20 Weight (g): 2340 Length ^{mm}(cm): 710 mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____
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☐ other(specify): _____	☐ other(specify): _____																					
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____

GILLS: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left:</th> <th style="text-align: left; border-bottom: 1px solid black;">Right:</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ frayed</td> <td>☐ frayed</td> </tr> <tr> <td>☐ marginate</td> <td>☐ marginate</td> </tr> <tr> <td>☐ pale</td> <td>☐ pale</td> </tr> <tr> <td>☐ other (specify): _____</td> <td>☐ other (specify): _____</td> </tr> </table>	Left:	Right:	☒ normal	☒ normal	☐ frayed	☐ frayed	☐ marginate	☐ marginate	☐ pale	☐ pale	☐ other (specify): _____	☐ other (specify): _____	DELTS: ☐ Deformities ☐ Erosion ☐ Lesions ☐ Tumors
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☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-016

Time: 14:16 Weight (g): 545 Length (mm): 410

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots leech(es) black spot(s) Anchor worm(s) other (specify): 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify):</td> <td>☐ other(specify):</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):	_____	_____	_____	_____	_____	_____
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____

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☒ normal	☒ normal												
☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-015

Time: 14:35 Weight (g): 835g Length (^{mm}cm): 500mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border: none;"><u>Left</u></th> <th style="text-align: left; border: none;"><u>Right</u></th> </tr> <tr> <td style="border: none;">☒ normal</td> <td style="border: none;">☒ normal</td> </tr> <tr> <td style="border: none;">☐ exophthalmic</td> <td style="border: none;">☐ exophthalmic</td> </tr> <tr> <td style="border: none;">☐ opaque</td> <td style="border: none;">☐ opaque</td> </tr> <tr> <td style="border: none;">☐ missing</td> <td style="border: none;">☐ missing</td> </tr> <tr> <td style="border: none;">☐ hemorrhagic</td> <td style="border: none;">☐ hemorrhagic</td> </tr> <tr> <td style="border: none;">☐ emboli</td> <td style="border: none;">☐ emboli</td> </tr> <tr> <td style="border: none;">☐ other(specify):</td> <td style="border: none;">☐ other(specify):</td> </tr> <tr> <td style="border: none;"> _____</td> <td style="border: none;"> _____</td> </tr> <tr> <td style="border: none;"> _____</td> <td style="border: none;"> _____</td> </tr> <tr> <td style="border: none;"> _____</td> <td style="border: none;"> _____</td> </tr> </table>	<u>Left</u>	<u>Right</u>	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):	 _____	 _____	 _____	 _____	 _____	 _____
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____

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☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-016

Time: 14:50 Weight (g): 835 Length (cm): ^{mm}500

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots leech(es) black spot(s) Anchor worm(s) other (specify): 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px;"> ☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): </td> <td style="padding: 2px;"> ☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): </td> </tr> </table>	Left	Right	☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): 	☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify):
Left	Right					
☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): 	☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): 					

OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____

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Left:	Right:				
☒ normal ☐ frayed ☐ marginate ☐ pale ☐ other (specify): _____	☒ normal ☐ frayed ☐ marginate ☐ pale ☐ other (specify): _____				

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-017

Time: 15:01 Weight (g): 480 Length (cm): ^{mm}440

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots leech(es) black spot(s) Anchor worm(s) other (specify): ☐ ☐ ☐ ☐ ☐	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify):</td> <td>☐ other(specify):</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):	_____	_____	_____	_____	_____	_____
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_____	_____																							
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____

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FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/25/2017 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-018

Time: 15:11 Weight (g): 250g Length ^{mm} (cm): 370 mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____

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☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-017

Time: 15:19 Weight (g): 730g Length (mm): 480mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____
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FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-018

Time: 15:32 Weight (g): 545 Length (cm): ^{mm}460 mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots leech(es) black spot(s) Anchor worm(s) other (specify): 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify):</td> <td>☐ other(specify):</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):	_____	_____	_____	_____	_____	_____
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____ _____

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FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-019

Time: 15:43 Weight (g): 425 Length (mm): 410 mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border: none;"><u>Left</u></th> <th style="text-align: left; border: none;"><u>Right</u></th> </tr> <tr> <td style="border: none;">☒ normal</td> <td style="border: none;">☒ normal</td> </tr> <tr> <td style="border: none;">☐ exophthalmic</td> <td style="border: none;">☐ exophthalmic</td> </tr> <tr> <td style="border: none;">☐ opaque</td> <td style="border: none;">☐ opaque</td> </tr> <tr> <td style="border: none;">☐ missing</td> <td style="border: none;">☐ missing</td> </tr> <tr> <td style="border: none;">☐ hemorrhagic</td> <td style="border: none;">☐ hemorrhagic</td> </tr> <tr> <td style="border: none;">☐ emboli</td> <td style="border: none;">☐ emboli</td> </tr> <tr> <td style="border: none;">☐ other(specify): _____</td> <td style="border: none;">☐ other(specify): _____</td> </tr> </table>	<u>Left</u>	<u>Right</u>	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____
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FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-019

Time: 16:56 Weight (g): 590g Length (^{mm}cm): 450mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____

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FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-020

Time: 16:06 Weight (g): 525 Length (cm): ^{mm}430 mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots leech(es) black spot(s) Anchor worm(s) other (specify): 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify):</td> <td>☐ other(specify):</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):	_____	_____	_____	_____	_____	_____
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FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-020

Time: 16:16 Weight (g): 700g Length (mm): 455mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____
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FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-021

Time: 16:30 Weight (g): 890 Length ^{mm}/_{cm}: 495mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____

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FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/25/2018 Reach: 0 Indiv. Fish Sample No. EPA-NP-A-021

Time: 17:00 Weight (g): 555g Length (cm): ^{mm}420 mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots leech(es) black spot(s) Anchor worm(s) other (specify): _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;"> ☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): _____ _____ _____ </td> <td style="padding: 5px;"> ☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): _____ _____ _____ </td> </tr> </table>	Left	Right	☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): _____ _____ _____	☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): _____ _____ _____
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☒ normal ☐ frayed ☐ marginate ☐ pale ☐ other (specify): _____	☒ normal ☐ frayed ☐ marginate ☐ pale ☐ other (specify): _____				

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☒ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-022

Time: 17:10 Weight (g): 555 Length ^{mm}(cm): 449

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots leech(es) black spot(s) Anchor worm(s) other (specify): 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify):</td> <td>☐ other(specify):</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):	_____	_____	_____	_____	_____	_____
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☐ exophthalmic	☐ exophthalmic																							
☐ opaque	☐ opaque																							
☐ missing	☐ missing																							
☐ hemorrhagic	☐ hemorrhagic																							
☐ emboli	☐ emboli																							
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____ _____

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☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-023

Time: 17:17 Weight (g): 525 Length (cm): ^{mm}425mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots leech(es) black spot(s) Anchor worm(s) other (specify): 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify):</td> <td>☐ other(specify):</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):	_____	_____	_____	_____	_____	_____
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____ _____

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☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
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☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/25/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-024

Time: 17:24 Weight (g): 415 Length ^{mm}(cm): 390

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border: none;"><u>Left</u></th> <th style="text-align: left; border: none;"><u>Right</u></th> </tr> <tr> <td style="border: none;">☒ normal</td> <td style="border: none;">☒ normal</td> </tr> <tr> <td style="border: none;">☐ exophthalmic</td> <td style="border: none;">☐ exophthalmic</td> </tr> <tr> <td style="border: none;">☐ opaque</td> <td style="border: none;">☐ opaque</td> </tr> <tr> <td style="border: none;">☐ missing</td> <td style="border: none;">☐ missing</td> </tr> <tr> <td style="border: none;">☐ hemorrhagic</td> <td style="border: none;">☐ hemorrhagic</td> </tr> <tr> <td style="border: none;">☐ emboli</td> <td style="border: none;">☐ emboli</td> </tr> <tr> <td style="border: none;">☐ other(specify):</td> <td style="border: none;">☐ other(specify):</td> </tr> <tr> <td style="border: none;">_____</td> <td style="border: none;">_____</td> </tr> <tr> <td style="border: none;">_____</td> <td style="border: none;">_____</td> </tr> <tr> <td style="border: none;">_____</td> <td style="border: none;">_____</td> </tr> </table>	<u>Left</u>	<u>Right</u>	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):	_____	_____	_____	_____	_____	_____
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____

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☐ frayed	☐ frayed												
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☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/26/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-022

Time: 9:26 Weight (g): 890 Length ^{mm} (cm): 500

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____

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☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/26/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-023

Time: 9:40 Weight (g): 670 Length ^{mm}(cm): 465 mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____	_____	_____
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____

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☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/26/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-025

Time: 10:45 Weight (g): 670g Length ^{mm}(cm): 420 mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots leech(es) black spot(s) Anchor worm(s) other (specify): 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify):</td> <td>☐ other(specify):</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):	_____	_____	_____	_____	_____	_____
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____ _____

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☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 07/26/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-026

Time: 10:57 Weight (g): 525 Length (^{mm}cm): 440

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> </table> _____ _____ _____ <i>Some damage but ^(kid) from killing blow</i>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____
Left	Right																	
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☐ exophthalmic	☐ exophthalmic																	
☐ opaque	☐ opaque																	
☐ missing	☐ missing																	
☐ hemorrhagic	☐ hemorrhagic																	
☐ emboli	☐ emboli																	
☐ other(specify): _____	☐ other(specify): _____																	

OPERCULA: ☐ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____

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Left:	Right:												
☒ normal	☒ normal												
☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/26/2008 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-027
 Time: 11:11 Weight (g): 495 Length (mm): 449

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____ _____	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☐ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☒ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table> <i>likely due to hitting blow</i>	Left	Right	☐ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☒ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____	_____	_____
Left	Right																							
☐ normal	☒ normal																							
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☒ hemorrhagic	☐ hemorrhagic																							
☐ emboli	☐ emboli																							
☐ other(specify): _____	☐ other(specify): _____																							
_____	_____																							
_____	_____																							
_____	_____																							

OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____ _____

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Left:	Right:												
☒ normal	☒ normal												
☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/24/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-028

Time: 11:27 Weight (g): 440 Length (^{mm}cm): 410

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots leech(es) black spot(s) Anchor worm(s) other (specify): 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%; border-collapse: collapse;"> <tr> <th style="text-align: center; border-bottom: 1px solid black;">Left</th> <th style="text-align: center; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px;"> ☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): </td> <td style="padding: 5px;"> ☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): </td> </tr> </table>	Left	Right	☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): 	☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify):
Left	Right					
☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): 	☒ normal ☐ exophthalmic ☐ opaque ☐ missing ☐ hemorrhagic ☐ emboli ☐ other(specify): 					

OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____ _____

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Left:	Right:				
☒ normal ☐ frayed ☐ marginate ☐ pale ☐ other (specify): _____	☒ normal ☐ frayed ☐ marginate ☐ pale ☐ other (specify): _____				

FINS: ☐ normal ☐ mild erosion ☐ severe erosion ☒ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/26/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-029

Time: 11:41 Weight (g): 420 Length (^{mm}cm): 415

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify):</td> <td>☐ other(specify):</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):	_____	_____	_____	_____	_____	_____
Left	Right																							
☒ normal	☒ normal																							
☐ exophthalmic	☐ exophthalmic																							
☐ opaque	☐ opaque																							
☐ missing	☐ missing																							
☐ hemorrhagic	☐ hemorrhagic																							
☐ emboli	☐ emboli																							
☐ other(specify):	☐ other(specify):																							
_____	_____																							
_____	_____																							
_____	_____																							

OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____

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Left:	Right:												
☒ normal	☒ normal												
☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☐ normal ☐ mild erosion ☐ severe erosion ☒ frayed, mild	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/26/2008 Reach: _____ Indiv. Fish Sample No. EPA-NP-A-030

Time: 12:30 Weight (g): 570 Length (mm): 440

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): ☐ white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): _____ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____ _____	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____	_____	_____
Left	Right																							
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☐ emboli	☐ emboli																							
☐ other(specify): _____	☐ other(specify): _____																							
_____	_____																							
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____ _____

GILLS: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left:</th> <th style="text-align: left; width: 50%;">Right:</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ frayed</td> <td>☐ frayed</td> </tr> <tr> <td>☐ marginate</td> <td>☐ marginate</td> </tr> <tr> <td>☐ pale</td> <td>☐ pale</td> </tr> <tr> <td>☐ other (specify): _____</td> <td>☐ other (specify): _____</td> </tr> </table>	Left:	Right:	☒ normal	☒ normal	☐ frayed	☐ frayed	☐ marginate	☐ marginate	☐ pale	☐ pale	☐ other (specify): _____	☐ other (specify): _____	DELTS: ☐ Deformities ☐ Erosion ☐ Lesions ☐ Tumors
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☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☐ normal ☐ mild erosion ☐ severe erosion ☒ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____ _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/26/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-624

Time: 12:50 Weight (g): 715g Length ^{mm} (cm): 475mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots leech(es) black spot(s) Anchor worm(s) other (specify): 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify):</td> <td>☐ other(specify):</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):	_____	_____	_____	_____	_____	_____
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☐ emboli	☐ emboli																							
☐ other(specify):	☐ other(specify):																							
_____	_____																							
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____ _____

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☐ frayed	☐ frayed												
☐ marginate	☐ marginate												
☐ pale	☐ pale												
☐ other (specify): _____	☐ other (specify): _____												

FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/26/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-025

Time: 13:18 Weight (g): 1015g Length ^{mm} ~~cm~~: 525mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots leech(es) black spot(s) Anchor worm(s) other (specify): 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%; border-collapse: collapse;"> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Left</th> <th style="text-align: left; border-bottom: 1px solid black;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify):</td> <td>☐ other(specify):</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify):	☐ other(specify):	_____	_____	_____	_____	_____	_____
Left	Right																							
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☐ hemorrhagic	☐ hemorrhagic																							
☐ emboli	☐ emboli																							
☐ other(specify):	☐ other(specify):																							
_____	_____																							
_____	_____																							
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____ _____ _____ _____

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FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/26/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-026

Time: 14:13 Weight (g): 660 Length (mm) (cm): 460

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____
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FINS: ☐ normal ☐ mild erosion ☐ severe erosion ☒ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/26/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-027

Time: 14:28 Weight (g): 1890g Length ^{mm}_(cm): 660mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ 	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): 	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____
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OPERCULA: ☒ normal ☐ slight shortening ☐ severe shortening	☐ Other (specify): _____

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FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☒ frayed, mild	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/26/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-028

Time: 14:43 Weight (g): 650 Length (cm): ^{mm}465

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border: none;"><u>Left</u></th> <th style="text-align: left; border: none;"><u>Right</u></th> </tr> <tr> <td style="border: none;">☐ normal</td> <td style="border: none;">☐ normal</td> </tr> <tr> <td style="border: none;">☐ exophthalmic</td> <td style="border: none;">☐ exophthalmic</td> </tr> <tr> <td style="border: none;">☐ opaque</td> <td style="border: none;">☐ opaque</td> </tr> <tr> <td style="border: none;">☐ missing</td> <td style="border: none;">☐ missing</td> </tr> <tr> <td style="border: none;">☒ hemorrhagic</td> <td style="border: none;">☒ hemorrhagic</td> </tr> <tr> <td style="border: none;">☐ emboli</td> <td style="border: none;">☐ emboli</td> </tr> <tr> <td style="border: none;">☐ other(specify): _____ _____</td> <td style="border: none;">☐ other(specify): _____ _____</td> </tr> </table> <i>likely due to killing blow</i>	<u>Left</u>	<u>Right</u>	☐ normal	☐ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☒ hemorrhagic	☒ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____ _____	☐ other(specify): _____ _____
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FINS: ☒ normal ☐ mild erosion ☐ severe erosion ☐ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/26/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-029

Time: 15:06 Weight (g): 1560g Length ^{mm} (cm): 615 mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____	EYES: <table style="width:100%; border: none;"> <tr> <th style="text-align: left; border: none;"><u>Left</u></th> <th style="text-align: left; border: none;"><u>Right</u></th> </tr> <tr> <td style="border: none;">☒ normal</td> <td style="border: none;">☒ normal</td> </tr> <tr> <td style="border: none;">☐ exophthalmic</td> <td style="border: none;">☐ exophthalmic</td> </tr> <tr> <td style="border: none;">☐ opaque</td> <td style="border: none;">☐ opaque</td> </tr> <tr> <td style="border: none;">☐ missing</td> <td style="border: none;">☐ missing</td> </tr> <tr> <td style="border: none;">☐ hemorrhagic</td> <td style="border: none;">☐ hemorrhagic</td> </tr> <tr> <td style="border: none;">☐ emboli</td> <td style="border: none;">☐ emboli</td> </tr> <tr> <td style="border: none;">☐ other(specify): _____ _____</td> <td style="border: none;">☐ other(specify): _____ _____</td> </tr> </table>	<u>Left</u>	<u>Right</u>	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____ _____	☐ other(specify): _____ _____
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FINS: ☐ normal ☐ mild erosion ☐ severe erosion ☒ frayed	☐ hemorrhagic ☐ emboli ☐ other (specify): _____

2018 FISH EXTERNAL EXAMINATION FORM
Upper Columbia River (UCR) Northern Pike Tissue Study

Date (MM/DD/YYYY): 7/26/2018 Reach: _____ Indiv. Fish Sample No. EPA-NP-B-030

Time: 15:21 Weight (g): 775 Length ^{mm}(cm): 505 mm

EXTERNAL EXAMINATION: (check all that apply)

BODY SURFACE: ☒ normal ☐ raised growth(s) ☐ reddened lesion(s) ☐ spinal deformities ☐ hemorrhagic body ☐ focal discoloration ☐ body fungus ☐ parasites(s) (specify): white spots ☐ leech(es) ☐ black spot(s) ☐ Anchor worm(s) ☐ other (specify): ☐ _____ _____	HEAD & ORAL CAVITY: ☒ normal head ☐ deformed head ☐ upper lip growth ☐ lower lip growth ☐ swollen nare BARBELS: ☐ normal ☐ missing ☐ stubbed ☐ deformed ☐ other (specify): _____ _____ _____	EYES: <table style="width:100%;"> <tr> <th style="text-align: left; width: 50%;">Left</th> <th style="text-align: left; width: 50%;">Right</th> </tr> <tr> <td>☒ normal</td> <td>☒ normal</td> </tr> <tr> <td>☐ exophthalmic</td> <td>☐ exophthalmic</td> </tr> <tr> <td>☐ opaque</td> <td>☐ opaque</td> </tr> <tr> <td>☐ missing</td> <td>☐ missing</td> </tr> <tr> <td>☐ hemorrhagic</td> <td>☐ hemorrhagic</td> </tr> <tr> <td>☐ emboli</td> <td>☐ emboli</td> </tr> <tr> <td>☐ other(specify): _____</td> <td>☐ other(specify): _____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Left	Right	☒ normal	☒ normal	☐ exophthalmic	☐ exophthalmic	☐ opaque	☐ opaque	☐ missing	☐ missing	☐ hemorrhagic	☐ hemorrhagic	☐ emboli	☐ emboli	☐ other(specify): _____	☐ other(specify): _____	_____	_____	_____	_____
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(10)
2 7/24/2018 - UCR Northern Pike

Activities: Filleting Northern Pike for Human Health Risk Assessment

Weather: Sunny, 70°F but will be very hot today

Personnel: Kelly O'Neal / Jacobs

Josh Yount / Jacobs

Jon Edwards / NPS

Derrick / NPS intern

Lewis / NPS intern

8:15 - met at Comfort Inn in Colville to travel to Kettle Falls Marina.

8:45 - met NPS at NPS boat slip (Jon, Derrick, Lewis)

9:00 - met Tamara Knudson to coordinate receiving fish from tribe.

Spokane tribe set 16 gill nets yesterday (7/22) and the Colville tribe set 20 gill nets.

Contacts for tribe:

Charlie - 509 - 634 - 1026

B.V. - 509 - 634 - 1736

Alix - 509 - 389 - 1905

9:30 - tribe leaving to pick up nets.

Following in NPS boat

The first location will be in the Kettle/
Cam's bay.

Size bins for this study are:

A = 300 - 449 mm

B = 450 mm and greater

9:53 - Bill from Colville called; they have
2 fish in their 1st net in Springer
Bay.

48.63147 -118.08023

48.63148 -118.08111

Depth min 2.7 m

max 10.5 m

10:30 - 2 fish from Nancy creek
lower location

48.65320, -118.11044

Depth min 1.0 m

max 9.8 m

48.65706, -118.10989

1.0 - 6.9 m

biggest & smallest fish

4 7/24/2018

picked up Ash from Marcus boat launch
large pike & small

48.66515, -118.06994 1.04m

↓ one net

48.66549, -118.07019 2.12m

48.66549, -118.07019 1.17 - 2.0m

48.66587, -118.07051

11:45 - Fish from Tamara

48.66688, -118.06286

48.66690, -118.06282

depth 0.5 m both ends

8 fish

48.66704, -118.06487

48.66660, -118.06478

depth 0.6 - 1.76 m

Fish from Bill Singer Bay

48.63033, -118.07862

48.62981, -118.07909

2 fish

2.6 - 11.7m

48.62952, -118.07698

48.62905, -118.07749

2.6 - 10.8 m depth

4 fish

48.62818, -118.07504

48.62772, -118.07558

2.6 - 7.9 m depth

11 ~~12~~ fish

(X10)

12:49 fish from Alix

mouth of the Kettle

48.67260, -118.11351

depth 0.5 - 6.5 m

48.68369, -118.07938

depth 0.5 - 1.2 m

has big fish

48.68319, -118.07943

depth 1.2 - 15 m

6 7/24/2018

12:55 - Fish from Charlie

1 from 48.68400, -118.11245
48.68386, -118.11354

depth 2.0 - 6.4 m

2 Fish from 48.68414, -118.11628
48.68380, -118.11522

depth 3.0 - 4.0 m

13:15 - too many fish on board. Going back
to Kettle Falls to purchase more
ice to hold fish on ice while we
fillet.

13:30 - back on river filleting fish

16:00 - meeting up w/ Tamara for fish

48.69331, -118.01560

48.69319, -118.01619

depth 1.55 - 5.37 m
2 fish

48.70384, -118.02787

48.70358, -118.02826

1.42m - 4.75 m

1 fish

7/24/2018 7

17:00 - NPS crew needs to go in for
the day. Calling it a day.

Spokane and Colville handed off
roughly 53 Northern Pike. We were able
to process 21 Northern Pike, 10 from
"A" and 11 from "B". Fish that we
were unable to process were gutted,
swim bladders were punctured and sunk
in the channel. Fillets are frozen on dry
ice.

7/24/2018

Kayaker

8 July 25, 2018

Activities: Filletting Northern Pike for HHRA

Weather: Sunny, 94°F

Personnel: Kelly Onal, Josh Yount, Megan Lyons,
Derrick, Lewis

8:45am - met NPS boat

9:30am - met Bill from Colville Tribe near
Marcus boat launch. They had
no N. Pike in their 1st three
nets.

9:57 - 1 N. Pike from Bill's boat

48.62930, -118.07656

48.62877, -118.07694

depth 2.5 - 9.4 m

10:40 1 more fish from Bill

48.62643, -118.07375

48.62633, -118.07457

depth: 3.2 - 8.9 m

10:45 - Charlie had fish in the Kettle River

11:22 - 1 fish

48.73772, -118.72678

48.73785, -118.11974

2.0 - 3.2 m

2 Fish

48.73800, -118.11954

48.73796, -118.11848

2.0 - 2.9 m

1 Fish

48.73764, -118.11794

48.73698, -118.11763

2.0 - 4.1 m

1 Fish

48.73655, -118.11805

48.73582, -118.11750

2.0 - 3.7 m

11:30 - call with Marilyn Franthier. The fish we just collected from Charlie were too far up the Kettle River and will not be included in the study. These 5 fish will be gutted and sunk in the channel.

12:02 - collecting fish from Tamara

48.68350, -118.07902

48.68318, -118.07941

6 fish

1.0 - 1.5 m

Rite in the Rain.

10 7/25/2018

1 Fish

48.68383, -118.08244

48.68300, -118.08298

depth 1.0 - 4.4m

1 Fish

07326

48.66355, -118. ~~46~~

48.66375, -118.07385

depth 2.17 - 6.65m

1 Fish

48.66508, -118.06999

48.66544, -118.07025

depth .65 - 1.99m

12:46 - fish from bill

net 517 - 48.62167, -118.07317

48.62187, -118.07396

depth 2.3 - 7.8m

net 518

48.62006, -118.07358

48.62022, -118.07448

depth 2.2 - 7.7m

net 519

48.61752, -118.09058

48.61803, -118.09003

depth 2.1 - 9.2m

7/25/2008

11

mt 520 48.64643, -118.08147
 48.64623, -118.08217
 depth 1.9 - 9.8 m

14:20 - picking up fish from Tamara

8 ⁽¹⁰⁾ Ash ⁽¹⁰⁾ ~~2887~~
 48. ~~57365~~ 57365, -118. ~~08873~~ 08813
 48.57383, -118.08834
 depth 3.1 - 5.3 m

3 fish
 48.57411, -118.09495
 48.57393, -118.09471
 depth 1.3 - 2.0 m

17:30 - Finishing up for the day, Today's total
 is 24 fish. 14 from size class "A"
 and 10 "B" size class.

July 25
 7/25/2018

12 July 26, 2018

Activities: Filleting Northern Pike Br
Human Health Risk Assessment

Weather: Partly cloudy, high is supposed to be
91°F

Personnel: Kelly O'Neal / Jacobs
Josh Yount / Jacobs
Meghan Lyons / NPS
Lewis / NPS intern

8:30 - met NPS @ their dock in Kettle
Falls marina

9:15 - met Tamara's boat to collect fish

2 fish - 118.06889

48.66612, ~~118.06889~~ (KID)

48.66655, -118.06871

10:30 more fish from Tamara's boat

1 fish

48.68360, -118.07849

48.68315, -118.07860

depth 0.61 - 2.01m

4 fish

48.68376, -118.08071

48.68331, -118.08068

depth 0.49 - 1.02 m

1 Fish

48.68368, -118.07947

48.68335, -118.07940

depth 0.36 - 0.87m

1 Fish

48.68353, -118.08205

48.68386, -118.08247

depth 0.40 - 0.80m

11:52 - collecting fish from bill's boat

net 532 - 48.65296, -118.08488

48.65296, -118.08575

2.1 - 5.5m

net 533 - 48.65207, -118.08489

48.65217, -118.08568

1.9 - 4.7m

net 535 48.65108, -118.08463

48.65089, -118.08540

depth 2.4 - 7.4m

All "A" fish

net 539

48.62782, -118.07435

48.62753, -118.07508

1.8 - 7.0m

All "A" fish

Rite in the Rain

7/26/2016

12:50 - picking up fish from Tamara
2 "B" fish

48.57386, -118.08707

48.57412, -118.08761

depth 2.09 - 2.38 m

2 "B" fish

48.57335, -118.08826

48.57369, -118.08864

depth 1.46 - 5.44 m

1 fish

48.57434, -118.09444

48.57391, -118.09436

depth 0.47 - 1.64 m

1 fish

48.65262, -118.11034

48.65263, -118.10936

depth 0.89 - 7.09 m

13:30 fish from Tamara

1 fish 48.574101, -118.09178

48.57370, -118.09139

depth 1.27, - 1.43

15:30 - Processing of Northern Pike complete.
30 fish from size group "K" and 30
fish from size group "B".

This completes the sampling of Northern
pike for the 2018 study. NPS boat
now returning to dock. Will pack and
deliver samples to SCS courier in
Spokane, WA tomorrow (7/27/18). For
delivery to ALS Kelso lab.

~~Kuznetsov~~
~~7/24/2018~~

APPENDIX B

NORTHERN PIKE FILLET COMPOSITING PLAN

Kessel Cristy SPOK

From: Gauthier, Marilyn/PDX <Marilyn.Gauthier@jacobs.com>
Sent: Wednesday, August 1, 2018 11:42 AM
To: Kessel Cristy SPOK; Stifelman, Marc
Cc: McCaig Kris SPOK; Tonel, Monica; Mills Denise SPOK; Gauthier, Marilyn/PDX
Subject: RE: Northern Pike Composite Assignments
Attachments: NP composite assignments updated IDs.xlsx

Here is the updated workbook

From: Kessel Cristy SPOK <Cristy.Kessel@teck.com>
Sent: Wednesday, August 01, 2018 11:24 AM
To: Stifelman, Marc <Stifelman.Marc@epa.gov>
Cc: McCaig Kris SPOK <Kris.McCaig@teck.com>; Tonel, Monica <Tonel.Monica@epa.gov>; Mills Denise SPOK <Denise.Mills@teck.com>; Gauthier, Marilyn/PDX <Marilyn.Gauthier@jacobs.com>
Subject: [EXTERNAL] RE: Northern Pike Composite Assignments

Thank you Marc. Could we get a workbook with the updated composite sample IDs as suggested and agreed to that we can provide to the lab (ALS)?

Thanks,
Cristy

Cristy Kessel
Environmental Specialist
Teck American Incorporated
Mobile phone: 509.496.1160
Email: Cristy.Kessel@teck.com
www.teck.com

From: Stifelman, Marc <Stifelman.Marc@epa.gov>
Sent: Friday, July 27, 2018 12:52 PM
To: Mills Denise SPOK <Denise.Mills@teck.com>; Gauthier, Marilyn/PDX <Marilyn.Gauthier@jacobs.com>
Cc: O'Neal, Kelly/SAC <Kelly.ONeal@jacobs.com>; Dillon, Frank/DET <Frank.Dillon@jacobs.com>; McCaig Kris SPOK <Kris.McCaig@teck.com>; Kessel Cristy SPOK <Cristy.Kessel@teck.com>; Tonel, Monica <Tonel.Monica@epa.gov>; afeldpausch@ramboll.com; Derek M Pelletier <dpelletier@ramboll.com>
Subject: RE: Northern Pike Composite Assignments

Thank you. Agreed.

~~~~~

Marc Stifelman, Toxicologist  
U.S. Environmental Protection Agency, Region 10  
Working in RTP, NC until August 4  
Tele 919/541-7741  
[stifelman.marc@epa.gov](mailto:stifelman.marc@epa.gov)  
<https://scholar.google.com/citations?user=Rc6SxmIAAAAJ&hl=en>

---

**From:** Mills Denise SPOK [<mailto:Denise.Mills@teck.com>]  
**Sent:** Friday, July 27, 2018 1:08 PM  
**To:** Gauthier, Marilyn/PDX <[Marilyn.Gauthier@jacobs.com](mailto:Marilyn.Gauthier@jacobs.com)>; Stifelman, Marc <[Stifelman.Marc@epa.gov](mailto:Stifelman.Marc@epa.gov)>  
**Cc:** O'Neal, Kelly/SAC <[Kelly.ONEal@jacobs.com](mailto:Kelly.ONEal@jacobs.com)>; Dillon, Frank/DET <[Frank.Dillon@jacobs.com](mailto:Frank.Dillon@jacobs.com)>; McCaig Kris SPOK <[Kris.McCaig@teck.com](mailto:Kris.McCaig@teck.com)>; Kessel Cristy SPOK <[Cristy.Kessel@teck.com](mailto:Cristy.Kessel@teck.com)>; Tonel, Monica <[Tonel.Monica@epa.gov](mailto:Tonel.Monica@epa.gov)>; [afeldpausch@ramboll.com](mailto:afeldpausch@ramboll.com); Derek M Pelletier <[dpelletier@ramboll.com](mailto:dpelletier@ramboll.com)>  
**Subject:** RE: Northern Pike Composite Assignments

Marilyn and Marc,

The composite assignments look good. Our only recommendation is to provide full composite sample IDs to the lab. For example, a naming convention could be:

EPA-NP-A1  
EPA-NP-A2  
EPA-NP-B1

Please let us know if you have questions or would like to discuss this further.

Thank you,

Denise

**Denise Mills, R.G., L.Hg.**

Program Manager, Upper Columbia River  
Teck Resources Limited  
+1.509.623.4515

---

**From:** Gauthier, Marilyn/PDX <[Marilyn.Gauthier@jacobs.com](mailto:Marilyn.Gauthier@jacobs.com)>  
**Sent:** Friday, July 27, 2018 8:27 AM  
**To:** Tonel, Monica ([Tonel.Monica@epa.gov](mailto:Tonel.Monica@epa.gov)) <[Tonel.Monica@epa.gov](mailto:Tonel.Monica@epa.gov)>; Stifelman, Marc ([Stifelman.Marc@epa.gov](mailto:Stifelman.Marc@epa.gov)) <[Stifelman.Marc@epa.gov](mailto:Stifelman.Marc@epa.gov)>; McCaig Kris SPOK <[Kris.McCaig@teck.com](mailto:Kris.McCaig@teck.com)>; Mills Denise SPOK <[Denise.Mills@teck.com](mailto:Denise.Mills@teck.com)>; Kessel Cristy SPOK <[Cristy.Kessel@teck.com](mailto:Cristy.Kessel@teck.com)>  
**Cc:** O'Neal, Kelly/SAC <[Kelly.ONEal@jacobs.com](mailto:Kelly.ONEal@jacobs.com)>; Dillon, Frank/DET <[Frank.Dillon@jacobs.com](mailto:Frank.Dillon@jacobs.com)>  
**Subject:** Northern Pike Composite Assignments

I followed the compositing plan and assigned the fillet from each fish to a composite. Please review.

---

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| Size Group A |       |              |             |            |                   |           |
|--------------|-------|--------------|-------------|------------|-------------------|-----------|
| Date         | Time  | ID           | Length (mm) | Weight (g) | Fillet Weight (g) | Composite |
| 25-Jul-18    | 17:24 | EPA-NP-A-024 | 390         | 415        | 90                | EPA-NP-A1 |
| 25-Jul-18    | 14:16 | EPA-NP-A-016 | 410         | 545        | 95                | EPA-NP-A1 |
| 25-Jul-18    | 17:00 | EPA-NP-A-021 | 420         | 555        | 90                | EPA-NP-A1 |
| 24-Jul-18    | 10:30 | EPA-NP-A-002 | 445         | 590        | 136               | EPA-NP-A1 |
| 24-Jul-18    | 13:43 | EPA-NP-A-005 | 449         | 600        | 100               | EPA-NP-A1 |
| 25-Jul-18    | 13:02 | EPA-NP-A-014 | 375         | 340        | 75                | EPA-NP-A2 |
| 24-Jul-18    | 10:53 | EPA-NP-A-003 | 410         | 495        | 95                | EPA-NP-A2 |
| 25-Jul-18    | 13:10 | EPA-NP-A-015 | 425         | 510        | 170               | EPA-NP-A2 |
| 25-Jul-18    | 15:01 | EPA-NP-A-017 | 440         | 480        | 110               | EPA-NP-A2 |
| 24-Jul-18    | 13:46 | EPA-NP-A-006 | 445         | 555        | 120               | EPA-NP-A2 |
| 25-Jul-18    | 12:52 | EPA-NP-A-013 | 395         | 375        | 90                | EPA-NP-A3 |
| 26-Jul-18    | 11:41 | EPA-NP-A-029 | 415         | 420        | 105               | EPA-NP-A3 |
| 25-Jul-18    | 17:17 | EPA-NP-A-023 | 425         | 525        | 110               | EPA-NP-A3 |
| 26-Jul-18    | 10:57 | EPA-NP-A-026 | 440         | 525        | 140               | EPA-NP-A3 |
| 25-Jul-18    | 17:10 | EPA-NP-A-022 | 449         | 555        | 170               | EPA-NP-A3 |
| 25-Jul-18    | 15:11 | EPA-NP-A-018 | 370         | 250        | 95                | EPA-NP-A4 |
| 24-Jul-18    | 15:36 | EPA-NP-A-010 | 410         | 500        | 130               | EPA-NP-A4 |
| 25-Jul-18    | 16:06 | EPA-NP-A-020 | 430         | 525        | 110               | EPA-NP-A4 |
| 24-Jul-18    | 14:56 | EPA-NP-A-008 | 440         | 495        | 120               | EPA-NP-A4 |
| 26-Jul-18    | 11:11 | EPA-NP-A-027 | 449         | 495        | 90                | EPA-NP-A4 |
| 24-Jul-18    | 10:08 | EPA-NP-A-001 | 375         | 350        | 100               | EPA-NP-A5 |
| 25-Jul-18    | 15:43 | EPA-NP-A-019 | 410         | 425        | 95                | EPA-NP-A5 |
| 26-Jul-18    | 10:45 | EPA-NP-A-025 | 420         | 495        | 90                | EPA-NP-A5 |
| 26-Jul-18    | 12:30 | EPA-NP-A-030 | 440         | 570        | 130               | EPA-NP-A5 |
| 24-Jul-18    | 11:52 | EPA-NP-A-004 | 445         | 605        | 140               | EPA-NP-A5 |
| 24-Jul-18    | 15:30 | EPA-NP-A-009 | 380         | 350        | 115               | EPA-NP-A6 |
| 26-Jul-18    | 11:27 | EPA-NP-A-028 | 410         | 440        | 110               | EPA-NP-A6 |
| 25-Jul-18    | 12:37 | EPA-NP-A-012 | 425         | 585        | 160               | EPA-NP-A6 |
| 24-Jul-18    | 14:07 | EPA-NP-A-007 | 440         | 595        | 135               | EPA-NP-A6 |
| 25-Jul-18    | 11:00 | EPA-NP-A-011 | 445         | 600        | 160               | EPA-NP-A6 |

| Size Group B |       |              |             |            |                   |  | Composite |
|--------------|-------|--------------|-------------|------------|-------------------|--|-----------|
| Date         | Time  | ID           | Length (mm) | Weight (g) | Fillet Weight (g) |  |           |
| 24-Jul-18    | 14:38 | EPA-NP-B-006 | 455         | 690        | 165               |  | EPA-NP-B1 |
| 25-Jul-18    | 12:24 | EPA-NP-B-013 | 465         | 755        | 175               |  | EPA-NP-B1 |
| 26-Jul-18    | 9:40  | EPA-NP-B-023 | 465         | 670        | 145               |  | EPA-NP-B1 |
| 26-Jul-18    | 15:21 | EPA-NP-B-030 | 505         | 775        | 130               |  | EPA-NP-B1 |
| 26-Jul-18    | 14:28 | EPA-NP-B-027 | 660         | 1890       | 350               |  | EPA-NP-B1 |
| 25-Jul-18    | 10:01 | EPA-NP-B-012 | 450         | 490        | 125               |  | EPA-NP-B2 |
| 26-Jul-18    | 14:13 | EPA-NP-B-026 | 460         | 660        | 110               |  | EPA-NP-B2 |
| 25-Jul-18    | 14:35 | EPA-NP-B-015 | 500         | 835        | 140               |  | EPA-NP-B2 |
| 25-Jul-18    | 14:50 | EPA-NP-B-016 | 500         | 835        | 210               |  | EPA-NP-B2 |
| 24-Jul-18    | 15:14 | EPA-NP-B-007 | 700         | 2540       | 890               |  | EPA-NP-B2 |
| 24-Jul-18    | 15:49 | EPA-NP-B-008 | 455         | 635        | 135               |  | EPA-NP-B3 |
| 25-Jul-18    | 15:32 | EPA-NP-B-018 | 460         | 545        | 115               |  | EPA-NP-B3 |
| 25-Jul-18    | 16:30 | EPA-NP-B-021 | 495         | 890        | 180               |  | EPA-NP-B3 |
| 24-Jul-18    | 11:20 | EPA-NP-B-001 | 660         | 2275       | 400               |  | EPA-NP-B3 |
| 24-Jul-18    | 16:13 | EPA-NP-B-010 | 750         | 3210       | 620               |  | EPA-NP-B3 |
| 25-Jul-18    | 16:16 | EPA-NP-B-020 | 455         | 700        | 150               |  | EPA-NP-B4 |
| 24-Jul-18    | 13:00 | EPA-NP-B-004 | 460         | 645        | 160               |  | EPA-NP-B4 |
| 26-Jul-18    | 14:43 | EPA-NP-B-028 | 465         | 650        | 150               |  | EPA-NP-B4 |
| 26-Jul-18    | 15:06 | EPA-NP-B-029 | 615         | 1560       | 285               |  | EPA-NP-B4 |
| 25-Jul-18    | 13:20 | EPA-NP-B-014 | 710         | 2340       | 490               |  | EPA-NP-B4 |
| 24-Jul-18    | 14:20 | EPA-NP-B-005 | 455         | 630        | 165               |  | EPA-NP-B5 |
| 24-Jul-18    | 11:39 | EPA-NP-B-002 | 460         | 655        | 180               |  | EPA-NP-B5 |
| 26-Jul-18    | 12:50 | EPA-NP-B-024 | 475         | 715        | 125               |  | EPA-NP-B5 |
| 26-Jul-18    | 13:18 | EPA-NP-B-025 | 525         | 1015       | 220               |  | EPA-NP-B5 |
| 24-Jul-18    | 16:26 | EPA-NP-B-011 | 710         | 2445       | 460               |  | EPA-NP-B5 |
| 25-Jul-18    | 15:56 | EPA-NP-B-019 | 450         | 590        | 195               |  | EPA-NP-B6 |
| 24-Jul-18    | 16:00 | EPA-NP-B-009 | 465         | 705        | 180               |  | EPA-NP-B6 |
| 25-Jul-18    | 15:19 | EPA-NP-B-017 | 480         | 730        | 165               |  | EPA-NP-B6 |
| 26-Jul-18    | 9:26  | EPA-NP-B-022 | 500         | 890        | 165               |  | EPA-NP-B6 |
| 24-Jul-18    | 12:15 | EPA-NP-B-003 | 1070        | 7830       | 1130              |  | EPA-NP-B6 |

## APPENDIX C

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### DATA VALIDATION REPORT



October 16, 2018

Ms. Denise Mills  
Program Manager, Upper Columbia River  
Teck American Incorporated  
501 N. Riverpoint Blvd.  
Suite 300  
Spokane, WA 99202

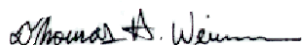
Dear Ms. Mills:

Enclosed is the quality assurance review for the inorganic analyses of the samples collected on July 25 and 26, 2018, and on August 3, 14, 15, 17, 21, 22, and 24, 2018, as part of the Upper Columbia River Northern Pike Tissue Study.

A few inorganic results were qualified as "not-detected" due to blank contamination. In addition, several inorganic results were qualified as estimated due to low matrix spike/matrix spike duplicate recoveries, serial dilution imprecision, negative instrument bias, and quantitation between the detection limit and the reporting limit. Overall, the data reviewed are usable with the qualifications presented in this report.

If you have any questions or comments, or if we can be of any further assistance, please feel free to call.

Sincerely,



Thomas H. Weinmann  
Senior Quality Assurance Chemist/  
Data Validation Task Manager

THW/RJV:hd  
Enc.

Sincerely,



Rock J. Vitale, CEAC  
Technical Director of Chemistry/  
Principal

**QUALITY ASSURANCE REVIEW OF THE  
UPPER COLUMBIA RIVER  
NORTHERN PIKE TISSUE STUDY  
SAMPLES COLLECTED ON  
JULY 25 AND 26, 2018 AND AUGUST 3, 14, 15, 17, 21, 22, AND 24, 2018  
SERVICE REQUESTS K1807185, K1807189, AND K1807597**

October 16, 2018

Prepared for:

**TECK AMERICAN INCORPORATED**  
501 N. Riverpoint Blvd.  
Suite 300  
Spokane, WA 99202

Prepared by:

**ENVIRONMENTAL STANDARDS, INC.**  
1140 Valley Forge Road  
P.O. Box 810  
Valley Forge, PA 19482-0810

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### Introduction

#### Section 1      **Quality Assurance Review**

- A.      Inorganic Data Review
- B.      Conclusions

#### Section 2      **Analytical Results**

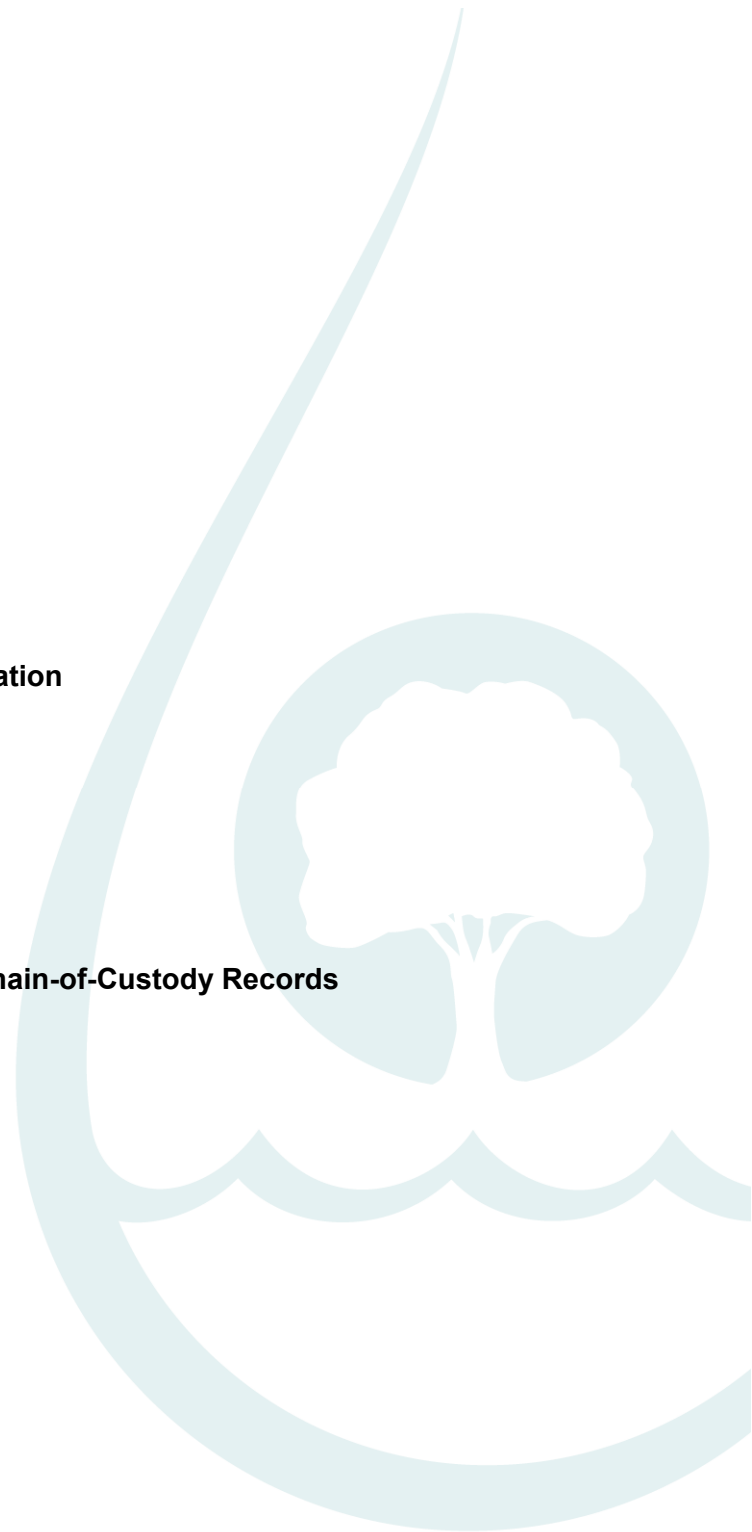
- A.      Service Request K1807185
- B.      Service Request K1807189
- C.      Service Request K1807597

#### Section 3      **Inorganic Data Support Documentation**

- A.      Service Request K1807185
- B.      Service Request K1807189
- C.      Service Request K1807597

#### Section 4      **Laboratory Case Narratives and Chain-of-Custody Records**

#### Section 5      **Project Correspondence**



## Introduction

This quality assurance (QA) review is based upon an examination of the data generated from the analyses of the samples collected on July 25 and 26, 2018, and on August 3, 14, 15, 17, 21, 22, and 24, 2018, as part of the Upper Columbia River Northern Pike Tissue Study. The samples that have undergone a rigorous QA review are listed on Table 1. Table 1 also presents the laboratory sample number, collection date, matrix, parameter(s) examined, and the review level for each sample. Stage 4 review is a rigorous data validation inclusive of the evaluation of raw data and the verification of calculated results.

This review has been performed with direction from the “Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use,” (US EPA 540-R-08-005, January 2009); “US EPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review,” (US EPA 540-R-2017-001, January 2017); and the requirements specified in the “Quality Assurance Project Plan - Upper Columbia River Northern Pike Tissue Study” (QAPP, June 2018).

The reported analytical results are presented in Section 2. Any required data validation qualifications have been annotated on the data tables presented in Section 2. Data were examined to determine the usability of the analytical results and compliance relative to the requirements specified in the previously referenced documents and the analytical methods. In addition, the deliverables were evaluated for completeness and accuracy. Qualifier codes have been placed next to results on the data tables to enable the data user to quickly assess the qualitative and/or quantitative reliability of any result based on the criteria evaluated. Details of this QA review are presented in Section 1 of this report. This report was prepared to provide a critical review of the laboratory analyses and reported analytical results. Rigorous QA reviews of laboratory-generated data routinely identify problems associated with analytical measurements, even from the most experienced and capable laboratories.

**TABLE 1****SAMPLES INCLUDED IN THIS QUALITY ASSURANCE REVIEW**

| Teck American Incorporated<br>Sample Name | Laboratory Sample<br>Number(s)  | Date of<br>Sample<br>Collection | Matrix | Parameter(s)<br>Examined                                         | Review<br>Level |
|-------------------------------------------|---------------------------------|---------------------------------|--------|------------------------------------------------------------------|-----------------|
| EPA-NP-A1                                 | K1807185-006                    | 7/25/18                         | Tissue | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As, Lipid,<br>Moist | 4               |
| EPA-NP-A1MS                               | KQ1811997-05<br>K1807185-006MS  | 7/25/18                         | Tissue | M <sup>1</sup> , M <sup>2</sup> , Se<br>Hg, As                   | 4               |
| EPA-NP-A1MSD                              | KQ1811997-06<br>K1807185-006DMS | 7/25/18                         | Tissue | M <sup>1</sup> , M <sup>2</sup> , Se<br>Hg, As                   | 4               |
| EPA-NP-A1DUP<br>(Laboratory Duplicate)    | K1807185-006DUP                 | 7/25/18                         | Tissue | Hg, Lipid,<br>Moist                                              | 4               |
| EPA-NP-A1TRP<br>(Laboratory Triplicate)   | K1807185-006TRP                 | 7/25/18                         | Tissue | Hg, Lipid                                                        | 4               |
| EPA-NP-A2                                 | K1807185-012                    | 7/25/18                         | Tissue | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As, Lipid,<br>Moist | 4               |
| EPA-NP-A3                                 | K1807185-018                    | 7/26/18                         | Tissue | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As, Lipid,<br>Moist | 4               |
| EPA-NP-A4                                 | K1807185-024                    | 7/26/18                         | Tissue | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As, Lipid,<br>Moist | 4               |
| EPA-NP-A5                                 | K1807185-030                    | 7/26/18                         | Tissue | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As, Lipid,<br>Moist | 4               |
| EPA-NP-A6                                 | K1807185-036                    | 7/26/18                         | Tissue | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As, Lipid,<br>Moist | 4               |
| EPA-NP-A6DUP<br>(Laboratory Duplicate)    | K1807185-036DUP                 | 7/26/18                         | Tissue | As                                                               | 4               |
| EPA-NP-A6TRP<br>(Laboratory Triplicate)   | K1807185-036TRP                 | 7/26/18                         | Tissue | As                                                               | 4               |
| EPA-NP-B1                                 | K1807189-006                    | 7/26/18                         | Tissue | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As, Lipid,<br>Moist | 4               |

**TABLE 1 (Cont.)**

| Teck American Incorporated<br>Sample Name                     | Laboratory Sample<br>Number(s)  | Date of<br>Sample<br>Collection | Matrix | Parameter(s)<br>Examined                                         | Review<br>Level |
|---------------------------------------------------------------|---------------------------------|---------------------------------|--------|------------------------------------------------------------------|-----------------|
| EPA-NP-B1MS<br>(Matrix Spike)                                 | K1807189-006MS                  | 7/26/18                         | Tissue | Hg, As                                                           | 4               |
| EPA-NP-B1MSD<br>(Matrix Spike Duplicate)                      | K1807189-006DMS                 | 7/26/18                         | Tissue | Hg, As                                                           | 4               |
| EPA-NP-B1DUP<br>(Laboratory Duplicate)                        | KQ1811997-08<br>K1807189-006DUP | 7/26/18                         | Tissue | M <sup>1</sup> , M <sup>2</sup> , Se<br>Lipid, Moist             | 4               |
| EPA-NP-B1TRP<br>(Laboratory Triplicate)                       | KQ1811997-09<br>K1807189-006TRP | 7/26/18                         | Tissue | M <sup>1</sup> , M <sup>2</sup> , Se<br>Lipid                    | 4               |
| EPA-NP-B2                                                     | K1807189-012                    | 7/26/18                         | Tissue | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As, Lipid,<br>Moist | 4               |
| EPA-NP-B3                                                     | K1807189-018                    | 7/25/18                         | Tissue | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As, Lipid,<br>Moist | 4               |
| EPA-NP-B4                                                     | K1807189-024                    | 7/26/18                         | Tissue | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As, Lipid,<br>Moist | 4               |
| EPA-NP-B5                                                     | K1807189-030                    | 7/26/18                         | Tissue | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As, Lipid,<br>Moist | 4               |
| EPA-NP-B6                                                     | K1807189-036                    | 7/26/18                         | Tissue | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As, Lipid,<br>Moist | 4               |
| Rinsate Blank-Northern Pike 8/14                              | K1807597-002                    | 8/14/18                         | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As                  | 4               |
| Rinsate Blank-Northern Pike 8/14MS<br>(Matrix Spike)          | KQ1811403-04                    | 8/14/18                         | Aq     | M <sup>1</sup>                                                   | 4               |
| Rinsate Blank-Northern Pike 8/14DUP<br>(Laboratory Duplicate) | KQ1811403-03                    | 8/14/18                         | Aq     | M <sup>1</sup>                                                   | 4               |
| Homogenization Blank-Northern Pike 8/14                       | K1807597-003                    | 8/14/18                         | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As                  | 4               |
| Homogenization Blank-Northern Pike 8/14                       | K1807597-004                    | 8/14/18                         | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As                  | 4               |
| Homogenization Blank-Northern Pike 8/14MS<br>(Matrix Spike)   | KQ1812163-04                    | 8/14/18                         | Aq     | M <sup>2</sup>                                                   | 4               |

**TABLE 1 (Cont.)**

| Teck American Incorporated<br>Sample Name                            | Laboratory Sample<br>Number(s) | Date of<br>Sample<br>Collection | Matrix | Parameter(s)<br>Examined                        | Review<br>Level |
|----------------------------------------------------------------------|--------------------------------|---------------------------------|--------|-------------------------------------------------|-----------------|
| Homogenization Blank-Northern Pike 8/14DUP<br>(Laboratory Duplicate) | KQ1812163-03                   | 8/14/18                         | Aq     | M <sup>2</sup>                                  | 4               |
| Rinsate Blank-Northern Pike 8/15                                     | K1807597-005                   | 8/15/18                         | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As | 4               |
| Homogenization Blank-Northern Pike 8/15                              | K1807597-006                   | 8/15/18                         | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As | 4               |
| Homogenization Blank-Northern Pike 8/15                              | K1807597-007                   | 8/15/18                         | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As | 4               |
| Rinsate Blank-Northern Pike 8/17                                     | K1807597-008                   | 8/17/18                         | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As | 4               |
| Rinsate Blank-Northern Pike 8/17MS<br>(Matrix Spike)                 | KQ1811637-04                   | 8/17/18                         | Aq     | M <sup>1</sup>                                  | 4               |
| Rinsate Blank-Northern Pike 8/17DUP<br>(Laboratory Duplicate)        | KQ1811637-03                   | 8/17/18                         | Aq     | M <sup>1</sup>                                  | 4               |
| Homogenization Blank-Northern Pike 8/17                              | K1807597-009                   | 8/17/18                         | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As | 4               |
| Homogenization Blank-Northern Pike 8/17MS<br>(Matrix Spike)          | KQ1811638-04                   | 8/17/18                         | Aq     | M <sup>2</sup>                                  | 4               |
| Homogenization Blank-Northern Pike 8/17DUP<br>(Laboratory Duplicate) | KQ1811638-03                   | 8/17/18                         | Aq     | M <sup>2</sup>                                  | 4               |
| Homogenization Blank-Northern Pike 8/17                              | K1807597-010                   | 8/17/18                         | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As | 4               |
| Homogenization Blank-Northern Pike 8/17MS<br>(Matrix Spike)          | KQ1811639-04                   | 8/17/18                         | Aq     | Se                                              | 4               |
| Homogenization Blank-Northern Pike 8/17DUP<br>(Laboratory Duplicate) | KQ1811639-03                   | 8/17/18                         | Aq     | Se                                              | 4               |
| Rinsate Blank-Northern Pike 8/21                                     | K1807597-011                   | 8/21/18                         | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As | 4               |
| Homogenization Blank-Northern Pike 8/21                              | K1807597-012                   | 8/21/18                         | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As | 4               |
| Homogenization Blank-Northern Pike 8/21                              | K1807597-013                   | 8/21/18                         | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As | 4               |
| Rinsate Blank-Northern Pike 8/22                                     | K1807597-014                   | 8/22/18                         | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As | 4               |



**TABLE 1 (Cont.)**

| Teck American Incorporated<br>Sample Name | Laboratory Sample<br>Number(s) | Date of<br>Sample<br>Collection | Matrix | Parameter(s)<br>Examined                        | Review<br>Level |
|-------------------------------------------|--------------------------------|---------------------------------|--------|-------------------------------------------------|-----------------|
| Homogenization Blank-Northern Pike 8/22   | K1807597-015                   | 8/22/18                         | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As | 4               |
| Homogenization Blank-Northern Pike 8/22   | K1807597-016                   | 8/22/18                         | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As | 4               |
| Rinsate Blank-Northern Pike 8/24          | K1807597-017                   | 8/24/18                         | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As | 4               |
| Homogenization Blank-Northern Pike 8/24   | K1807597-018                   | 8/24/18                         | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As | 4               |
| Homogenization Blank-Northern Pike 8/24   | K1807597-019                   | 8/24/18                         | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As | 4               |
| Rinsate Blank-Northern Pike 8/03          | K1807597-020                   | 8/3/18                          | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As | 4               |
| Homogenization Blank-Northern Pike 8/03   | K1807597-021                   | 8/3/18                          | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As | 4               |
| Homogenization Blank-Northern Pike 8/03   | K1807597-022                   | 8/3/18                          | Aq     | M <sup>1</sup> , M <sup>2</sup> , Se,<br>Hg, As | 4               |

**NOTES:**

- M<sup>1</sup> - Total ICP Metals (specifically, aluminum, calcium, iron, magnesium, potassium, sodium, and sulfur) by SW-846 Method 6010C. (41 Stage 4 analyses)
- M<sup>2</sup> - Total ICP/MS Metals (specifically, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, silver, thallium, uranium, vanadium, and zinc) by SW-846 Method 6020A. (41 Stage 4 analyses)
- Se - Total Selenium by SW-846 Method 7742. (39 Stage 4 analyses)
- Hg - Total Mercury by US EPA Method 1631E. (39 Stage 4 analyses)
- As - Total Inorganic Arsenic by US EPA Method 1632A. (39 Stage 4 analyses)
- Lipid - Percent Lipids by Bligh-Dyer/Gravimetric.
- Moist - Percent Moisture by Freeze-dry/Gravimetric.
- Aq - Aqueous.

## Section 1      Quality Assurance Review

### A. Inorganic Data Review

The inorganic analyses of 53 samples (including quality control [QC] samples) collected as part of the Upper Columbia River Northern Pike Tissue Study on July 25 and 26, 2018, and on August 3, 14, 15, 17, 21, 22, and 24, 2018, were performed by ALS in Kelso, Washington. The specific samples and analyses reviewed are identified on Table 1.

The findings in this QA review are based upon a review of sample holding times, condition of samples upon laboratory receipt, blank analysis results, matrix spike/matrix spike duplicate (MS/MSD) results, post-digestion spike results, laboratory control sample/laboratory control sample duplicate (LCS/LCSD) results, standard reference material (SRM) sample results, laboratory replicate results, initial and continuing calibrations, sample preparation, reporting limit (RL) standard results, interference check sample results, serial dilution results, internal standard performance, instrument sensitivity, analytical sequence, and the quantitation of positive results. Any required data validation qualifications are annotated on the data tables presented in Section 2.

Issues are presented in two categories - deliverable issues and procedural issues. Deliverable issues are data issues that can easily be corrected and that may or may not impact the usability of the reported results. Procedural issues are issues that cannot be corrected and address method compliance issues; these issues may or may not impact the usability of the reported results. Comments, when present, address issues for which the data reviewer has provided information in order to clarify issues relating to the data; comments do not typically impact the usability of the reported results. The data reviewer has included copies of relevant raw data, QC forms, and other documentation needed to support any changes made to the data package in the Inorganic Data Support Documentation (Section 3) of this report. The following issues do not necessarily affect data usability (*viz.*, items necessitating data qualification).

### Deliverable Review

1. For Service Requests K1807185 and K1807189, the laboratory initially reported selenium results by SW-846 Method 6020A. According to the QAPP (Table 3), the recommended method of analysis for selenium is SW-846 Method 7742. Upon Environmental Standards, Inc.'s (Environmental Standards') request, the laboratory provided revised data packages and electronic data deliverables (EDDs) to report selenium by the QAPP-defined method (see Project Correspondence [Section 5]).
2. For Service Request K1807189, the laboratory did not include the lipids raw benchsheet in the data package provided. Upon Environmental Standards' request, the laboratory provided the missing data (see Section 5).
3. In the metals fraction of Service Request K1807597, the laboratory did not summarize the results for the serial dilution analysis performed on 8/30/18 at 16:07, on Instrument K-ICP-MS-04 in the data package provided. The data reviewer used the associated raw data to evaluate the serial dilution analysis. Qualification of data due to this issue was not warranted.

4. For Service Request K1807597, the laboratory did not include the total inorganic arsenic raw data for sample K1807597-015 and the subsequent calibration verification standard analyzed on 8/27/18, in the data package provided. Upon Environmental Standards' request, the laboratory provided the missing data (see Section 5).

#### Procedural Review

- Procedural issues were not observed for the data in this QA review.

With regard to data usability, the principal areas of concern are blank contamination, low MS/MSD recoveries, serial dilution imprecision, negative instrument bias, and quantitation between the detection limit (DL) and the RL. Based upon a complete review of the data package provided, the following qualifiers are offered. The following data usability issues represent an interpretation of the QC results obtained for the project samples. Quite often, data qualifications address issues relating to sample matrix problems. Similarly, the data validation guidelines routinely specify areas of the data that require qualification, yet the methods used for analysis may not require corrective action by the laboratory. Accordingly, the following data usability issues should not be construed as an indication of laboratory performance.

#### Inorganic Data Qualifiers

- Due to its presence in the associated calibration blanks, the positive results for iron in Service Request K1807185 sample EPA-NP-A4 and Service Request K1807189 samples EPA-NP-B1 and EPA-NP-B3 should be considered "not-detected" and have been flagged "U\*" on the data tables. The reported result value has replaced the DL and RL (if the value exceeded the RL) on the data tables.
- The positive results for selenium in all Service Request K1807185 and Service Request K1807189 samples should be considered estimated, biased low, and have been flagged "J-" on the data tables. Low recoveries (< 75%) were observed for selenium in the associated MS/MSD analyses.
- The detection limits for total inorganic arsenic in all Service Request K1807185 and Service Request K1807189 samples may be higher than reported, and the "not-detected" results have been flagged "UJ" on the data tables. In addition, the positive result for total inorganic arsenic in Service Request K1807185 sample EPA-NP-A6DUP should be considered estimated, biased low, and has been flagged "J-" (unless flagged "J") on the data tables. Low recoveries (< 50%) were observed for total inorganic arsenic in the associated MS/MSD analyses.

- The positive results for copper, manganese, and zinc in all Service Request K1807185 and Service Request K1807189 samples should be considered estimated and have been flagged “J” on the data tables. High percent differences (%Ds > 10% when the initial result was > 50× the DL) were observed between the results for these analytes in the associated serial dilution analysis.
- The detection limits for sulfur in all Service Request K1807597 samples, except samples Rinsate Blank-Northern Pike 8/03, Homogenization Blank-Northern Pike 8/03 (K1807597-021), and Homogenization Blank-Northern Pike 8/03 (K1807597-022), may be higher than reported, and the “not-detected” results have been flagged “UJ” on the data tables. In addition, the positive results for sulfur in Service Request K1807597 samples Rinsate Blank-Northern Pike 8/14 and Rinsate Blank-Northern Pike 8/14DUP should be considered estimated, biased low, and have been flagged “J-” (unless flagged “J”) on the data tables. Significant negative instrument bias (> 2× the DL) was observed for sulfur in the associated calibration blanks.
- The detection limits for manganese in Service Request K1807597 samples Homogenization Blank-Northern Pike 8/17 (K1807597-010), Rinsate Blank-Northern Pike 8/21, Homogenization Blank-Northern Pike 8/21 (K1807597-012), Homogenization Blank-Northern Pike 8/21 (K1807597-013), Homogenization Blank-Northern Pike 8/22 (K1807597-015), Homogenization Blank-Northern Pike 8/22 (K1807597-016), Rinsate Blank-Northern Pike 8/24, Homogenization Blank-Northern Pike 8/24 (K1807597-018), and Homogenization Blank-Northern Pike 8/24 (K1807597-019) may be higher than reported, and the “not-detected” results have been flagged “UJ” on the data tables. In addition, the positive results for manganese in Service Request K1807597 samples Homogenization Blank-Northern Pike 8/17DUP (KQ1811638-03) and Rinsate Blank-Northern Pike 8/22 should be considered estimated, biased low, and have been flagged “J-” (unless flagged “J”) on the data tables. Significant negative instrument bias (> 2× the DL) was observed for manganese in the associated calibration blanks.
- The detection limits for iron in Service Request K1807597 samples Rinsate Blank-Northern Pike 8/03, Homogenization Blank-Northern Pike 8/03 (K1807597-021), and Homogenization Blank-Northern Pike 8/03 (K1807597-022) and for magnesium in Service Request K1807597 sample Homogenization Blank-Northern Pike 8/03 (K1807597-022) may be higher than reported, and the “not-detected” results have been flagged “UJ” on the data tables. In addition, the positive results for magnesium in Service Request K1807597 samples Rinsate Blank-Northern Pike 8/03 and Homogenization Blank-Northern Pike 8/03 (K1807597-021) should be considered estimated, biased low, and have been flagged “J-” (unless flagged “J”) on the data tables. Significant negative instrument bias (> 2× the DL) was observed for iron and magnesium in the associated calibration blanks.
- Reported positive results between the DL and the RL should be considered estimated and have been flagged “J” on the data tables.
- When sample results were qualified both as estimated with a direction of bias (“J+” or “J-”) and as estimated with unknown bias (“J”), only the unknown bias qualifier has been included on the data tables.

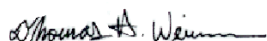
Complete support documentation for this inorganic QA review is presented in Section 3 of this report. The cover sheets for this section are a checklist of all QA procedures required by the protocol and examined in this data review.



## B. Conclusions

This QA review has identified several aspects of the data that required qualification. The data users should understand the qualifications and limitations of data specified in the QA review prior to using the data. The Laboratory Case Narratives and Chain-of-Custody Records are presented in Section 4. Project Correspondence is provided in Section 5.

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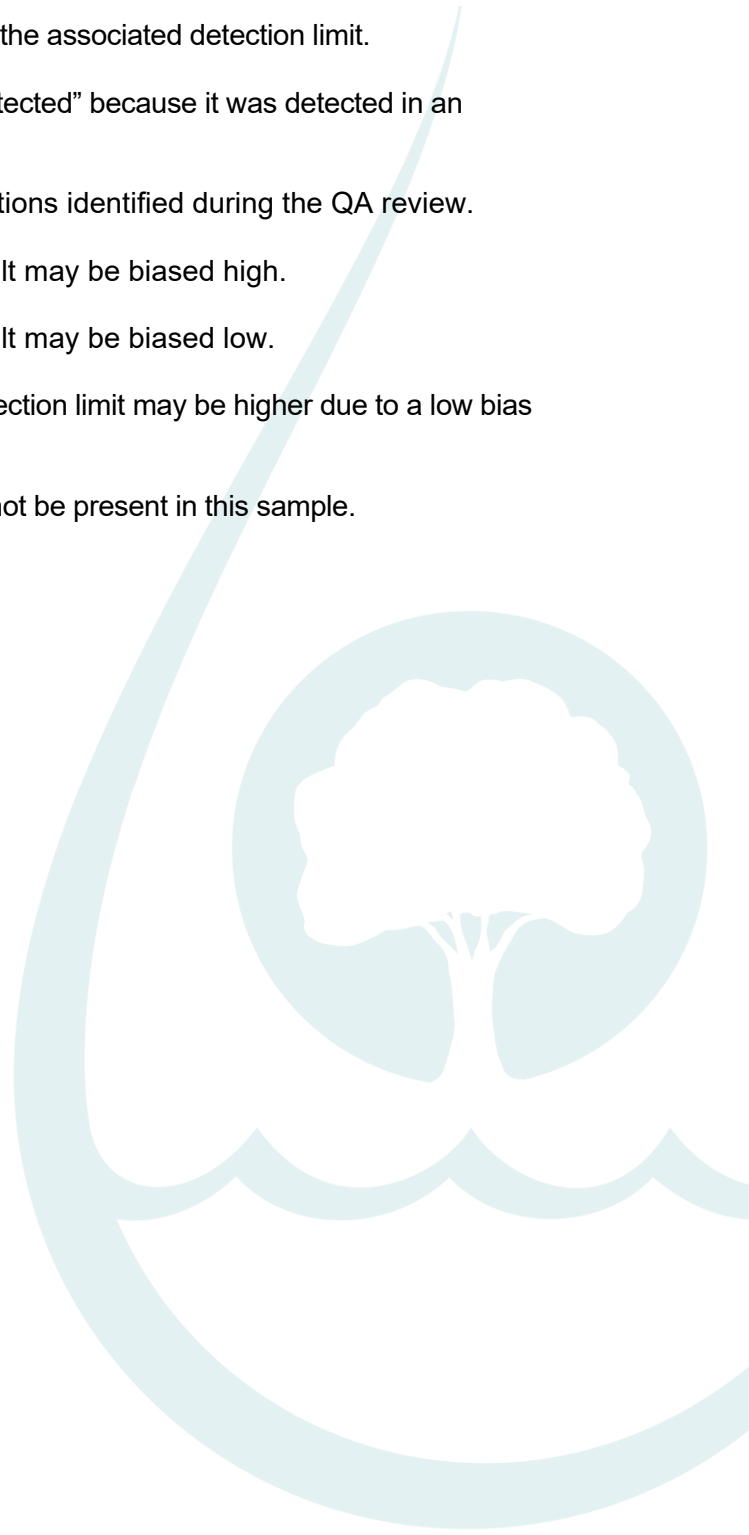
## **SECTION 2**

### **ANALYTICAL RESULTS**



## **DATA VALIDATION QUALIFIER NOTES**

- U The analyte was not detected at or above the associated detection limit.
- U\* The analyte should be considered “not-detected” because it was detected in an associated blank at a similar level.
- J Quantitation is approximate due to limitations identified during the QA review.
- J+ Quantitation is approximate, but the result may be biased high.
- J- Quantitation is approximate, but the result may be biased low.
- UJ The analyte was not detected and the detection limit may be higher due to a low bias identified during the QA review.
- R Unusable result; the analyte may or may not be present in this sample.



**A. SERVICE REQUEST K1807185**

**Teck American Incorporated**  
**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807185**

|             |           |         | Sample  | EPA-NP-A1           |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|---------|---------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID  | K1807185-006        |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units   | Original Lab Result | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/g    | 347                 | 347        |           |                 | 0.45            | 5               | No        | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/g    | 0.02                | 0.02       | U         | UJ              | 0.007           | 0.02            | Yes       | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | mg/kg   | 1.0                 | 1.0        | U         | U               | 0.3             | 1.0             | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | mg/kg   | 2120                | 2120       |           |                 | 2.0             | 4.0             | No        | No         | No       | Yes        |
|             | Iron      | 7439896 | mg/kg   | 26.9                | 26.9       |           |                 | 1.0             | 8.0             | No        | No         | No       | Yes        |
|             | Magnesium | 7439954 | mg/kg   | 1450                | 1450       |           |                 | 0.6             | 1.0             | No        | No         | No       | Yes        |
|             | Potassium | 7440097 | mg/kg   | 20000               | 20000      |           |                 | 9               | 40              | No        | No         | No       | Yes        |
|             | Sodium    | 7440235 | mg/kg   | 2030                | 2030       |           |                 | 2               | 20              | No        | No         | No       | Yes        |
|             | Sulfur    | 7704349 | mg/kg   | 9530                | 9530       |           |                 | 1.0             | 8.0             | No        | No         | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | mg/kg   | 0.050               | 0.050      | U         | U               | 0.005           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | mg/kg   | 0.30                | 0.30       | J         | J               | 0.02            | 0.50            | Yes       | No         | No       | Yes        |
|             | Barium    | 7440393 | mg/kg   | 0.305               | 0.305      |           |                 | 0.020           | 0.050           | No        | No         | No       | Yes        |
|             | Beryllium | 7440417 | mg/kg   | 0.020               | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | mg/kg   | 0.010               | 0.010      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Chromium  | 7440473 | mg/kg   | 0.58                | 0.58       |           |                 | 0.02            | 0.20            | No        | No         | No       | Yes        |
|             | Cobalt    | 7440484 | mg/kg   | 0.023               | 0.023      |           |                 | 0.003           | 0.020           | No        | No         | No       | Yes        |
|             | Copper    | 7440508 | mg/kg   | 1.76                | 1.76       |           | J               | 0.03            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921 | mg/kg   | 0.011               | 0.011      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965 | mg/kg   | 1.81                | 1.81       |           | J               | 0.010           | 0.050           | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020 | mg/kg   | 0.28                | 0.28       |           |                 | 0.02            | 0.20            | No        | No         | No       | Yes        |
|             | Silver    | 7440224 | mg/kg   | 0.005               | 0.005      | J         | J               | 0.002           | 0.020           | Yes       | No         | No       | Yes        |
|             | Thallium  | 7440280 | mg/kg   | 0.057               | 0.057      |           |                 | 0.002           | 0.020           | No        | No         | No       | Yes        |
|             | Uranium   | 7440611 | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | mg/kg   | 0.20                | 0.20       | U         | U               | 0.02            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | mg/kg   | 23.2                | 23.2       |           | J               | 0.08            | 0.50            | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | mg/kg   | 3.40                | 3.40       |           | J-              | 0.05            | 0.10            | Yes       | No         | No       | Yes        |
| Freeze Dry  | Solids    |         | percent | 20.2                | 20.2       |           |                 |                 |                 | No        | No         | No       | Yes        |
| LabCalc     | Moisture  |         | percent | 79.8                | 79.8       |           |                 |                 |                 | No        | No         | No       | Yes        |
| NOAA LIPID  | Lipid     | Lipids  | percent | 0.47                | 0.47       |           |                 |                 | 0.25            | No        | No         | No       | Yes        |

**Teck American Incorporated**  
**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807185**

|             |           |         | <b>Sample</b> | EPA-NP-A1           |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|---------------|---------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | <b>Lab ID</b> | K1807185-006DUP     |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units         | Original Lab Result | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/g          | 339                 | 339        | =         |                 | 0.45            | 5               | No        | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/g          |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA6010C    | Aluminum  | 7429905 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Calcium   | 7440702 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Iron      | 7439896 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Magnesium | 7439954 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Potassium | 7440097 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Sodium    | 7440235 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Sulfur    | 7704349 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA6020A    | Antimony  | 7440360 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Arsenic   | 7440382 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Barium    | 7440393 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Beryllium | 7440417 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Cadmium   | 7440439 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Chromium  | 7440473 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Cobalt    | 7440484 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Copper    | 7440508 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Lead      | 7439921 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Manganese | 7439965 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Nickel    | 7440020 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Silver    | 7440224 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Thallium  | 7440280 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Uranium   | 7440611 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Vanadium  | 7440622 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Zinc      | 7440666 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA7742     | Selenium  | 7782492 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
| Freeze Dry  | Solids    |         | percent       | 20.2                | 20.2       |           |                 |                 |                 | No        | No         | No       | Yes        |
| LabCalc     | Moisture  |         | percent       |                     |            |           |                 |                 |                 |           |            |          |            |
| NOAA LIPID  | Lipid     | Lipids  | percent       | 0.54                | 0.54       |           |                 |                 | 0.25            | No        | No         | No       | Yes        |

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**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807185**

|             |           |         | <b>Sample</b> | EPA-NP-A1           |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|---------------|---------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | <b>Lab ID</b> | K1807185-006TRP     |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units         | Original Lab Result | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/g          | 365                 | 365        | =         |                 | 0.45            | 5               | No        | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/g          |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA6010C    | Aluminum  | 7429905 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Calcium   | 7440702 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Iron      | 7439896 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Magnesium | 7439954 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Potassium | 7440097 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Sodium    | 7440235 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Sulfur    | 7704349 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA6020A    | Antimony  | 7440360 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Arsenic   | 7440382 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Barium    | 7440393 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Beryllium | 7440417 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Cadmium   | 7440439 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Chromium  | 7440473 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Cobalt    | 7440484 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Copper    | 7440508 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Lead      | 7439921 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Manganese | 7439965 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Nickel    | 7440020 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Silver    | 7440224 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Thallium  | 7440280 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Uranium   | 7440611 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Vanadium  | 7440622 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Zinc      | 7440666 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA7742     | Selenium  | 7782492 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
| Freeze Dry  | Solids    |         | percent       |                     |            |           |                 |                 |                 |           |            |          |            |
| LabCalc     | Moisture  |         | percent       |                     |            |           |                 |                 |                 |           |            |          |            |
| NOAA LIPID  | Lipid     | Lipids  | percent       | 0.55                | 0.55       |           |                 |                 | 0.25            | No        | No         | No       | Yes        |

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|             |           |         | Sample  | EPA-NP-A2           |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|---------|---------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID  | K1807185-012        |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units   | Original Lab Result | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/g    | 294                 | 294        |           |                 | 0.44            | 4.9             | No        | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/g    | 0.02                | 0.02       | U         | UJ              | 0.007           | 0.02            | Yes       | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | mg/kg   | 1.0                 | 1.0        | U         | U               | 0.3             | 1.0             | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | mg/kg   | 2580                | 2580       |           |                 | 2.0             | 4.0             | No        | No         | No       | Yes        |
|             | Iron      | 7439896 | mg/kg   | 23.9                | 23.9       |           |                 | 1.0             | 8.0             | No        | No         | No       | Yes        |
|             | Magnesium | 7439954 | mg/kg   | 1450                | 1450       |           |                 | 0.6             | 1.0             | No        | No         | No       | Yes        |
|             | Potassium | 7440097 | mg/kg   | 19500               | 19500      |           |                 | 9               | 40              | No        | No         | No       | Yes        |
|             | Sodium    | 7440235 | mg/kg   | 1980                | 1980       |           |                 | 2               | 20              | No        | No         | No       | Yes        |
|             | Sulfur    | 7704349 | mg/kg   | 9360                | 9360       |           |                 | 1.0             | 8.0             | No        | No         | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | mg/kg   | 0.050               | 0.050      | U         | U               | 0.005           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | mg/kg   | 0.22                | 0.22       | J         | J               | 0.02            | 0.50            | Yes       | No         | No       | Yes        |
|             | Barium    | 7440393 | mg/kg   | 0.422               | 0.422      |           |                 | 0.020           | 0.050           | No        | No         | No       | Yes        |
|             | Beryllium | 7440417 | mg/kg   | 0.020               | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | mg/kg   | 0.007               | 0.007      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Chromium  | 7440473 | mg/kg   | 0.77                | 0.77       |           |                 | 0.02            | 0.20            | No        | No         | No       | Yes        |
|             | Cobalt    | 7440484 | mg/kg   | 0.022               | 0.022      |           |                 | 0.003           | 0.020           | No        | No         | No       | Yes        |
|             | Copper    | 7440508 | mg/kg   | 2.51                | 2.51       |           | J               | 0.03            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921 | mg/kg   | 0.016               | 0.016      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965 | mg/kg   | 1.96                | 1.96       |           | J               | 0.010           | 0.050           | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020 | mg/kg   | 0.35                | 0.35       |           |                 | 0.02            | 0.20            | No        | No         | No       | Yes        |
|             | Silver    | 7440224 | mg/kg   | 0.004               | 0.004      | J         | J               | 0.002           | 0.020           | Yes       | No         | No       | Yes        |
|             | Thallium  | 7440280 | mg/kg   | 0.068               | 0.068      |           |                 | 0.002           | 0.020           | No        | No         | No       | Yes        |
|             | Uranium   | 7440611 | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | mg/kg   | 0.20                | 0.20       | U         | U               | 0.02            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | mg/kg   | 24.6                | 24.6       |           | J               | 0.08            | 0.50            | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | mg/kg   | 1.44                | 1.44       |           | J-              | 0.05            | 0.10            | Yes       | No         | No       | Yes        |
| Freeze Dry  | Solids    |         | percent | 19.5                | 19.5       |           |                 |                 |                 | No        | No         | No       | Yes        |
| LabCalc     | Moisture  |         | percent | 80.5                | 80.5       |           |                 |                 |                 | No        | No         | No       | Yes        |
| NOAA LIPID  | Lipid     | Lipids  | percent | 0.45                | 0.45       |           |                 |                 | 0.25            | No        | No         | No       | Yes        |

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**Upper Columbia River 2018 Northern Pike Tissue Study**  
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|             |           |         | Sample  | EPA-NP-A3           |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|---------|---------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID  | K1807185-018        |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units   | Original Lab Result | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/g    | 402                 | 402        |           |                 | 0.44            | 4.9             | No        | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/g    | 0.02                | 0.02       | U         | UJ              | 0.007           | 0.02            | Yes       | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | mg/kg   | 3.60                | 3.60       |           |                 | 0.3             | 1.0             | No        | No         | No       | Yes        |
|             | Calcium   | 7440702 | mg/kg   | 868                 | 868        |           |                 | 2.0             | 4.0             | No        | No         | No       | Yes        |
|             | Iron      | 7439896 | mg/kg   | 35.6                | 35.6       |           |                 | 1.0             | 8.0             | No        | No         | No       | Yes        |
|             | Magnesium | 7439954 | mg/kg   | 1370                | 1370       |           |                 | 0.6             | 1.0             | No        | No         | No       | Yes        |
|             | Potassium | 7440097 | mg/kg   | 19000               | 19000      |           |                 | 9               | 40              | No        | No         | No       | Yes        |
|             | Sodium    | 7440235 | mg/kg   | 1850                | 1850       |           |                 | 2               | 20              | No        | No         | No       | Yes        |
|             | Sulfur    | 7704349 | mg/kg   | 9570                | 9570       |           |                 | 1.0             | 8.0             | No        | No         | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | mg/kg   | 0.005               | 0.005      | J         | J               | 0.005           | 0.050           | Yes       | No         | No       | Yes        |
|             | Arsenic   | 7440382 | mg/kg   | 0.15                | 0.15       | J         | J               | 0.02            | 0.50            | Yes       | No         | No       | Yes        |
|             | Barium    | 7440393 | mg/kg   | 0.288               | 0.288      |           |                 | 0.020           | 0.050           | No        | No         | No       | Yes        |
|             | Beryllium | 7440417 | mg/kg   | 0.020               | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | mg/kg   | 0.005               | 0.005      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Chromium  | 7440473 | mg/kg   | 0.36                | 0.36       |           |                 | 0.02            | 0.20            | No        | No         | No       | Yes        |
|             | Cobalt    | 7440484 | mg/kg   | 0.020               | 0.020      |           |                 | 0.003           | 0.020           | No        | No         | No       | Yes        |
|             | Copper    | 7440508 | mg/kg   | 1.90                | 1.90       |           | J               | 0.03            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921 | mg/kg   | 0.008               | 0.008      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965 | mg/kg   | 1.40                | 1.40       |           | J               | 0.010           | 0.050           | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020 | mg/kg   | 0.18                | 0.18       | J         | J               | 0.02            | 0.20            | Yes       | No         | No       | Yes        |
|             | Silver    | 7440224 | mg/kg   | 0.003               | 0.003      | J         | J               | 0.002           | 0.020           | Yes       | No         | No       | Yes        |
|             | Thallium  | 7440280 | mg/kg   | 0.054               | 0.054      |           |                 | 0.002           | 0.020           | No        | No         | No       | Yes        |
|             | Uranium   | 7440611 | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | mg/kg   | 0.20                | 0.20       | U         | U               | 0.02            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | mg/kg   | 21.2                | 21.2       |           | J               | 0.08            | 0.50            | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | mg/kg   | 3.73                | 3.73       |           | J-              | 0.05            | 0.10            | Yes       | No         | No       | Yes        |
| Freeze Dry  | Solids    |         | percent | 20.6                | 20.6       |           |                 |                 |                 | No        | No         | No       | Yes        |
| LabCalc     | Moisture  |         | percent | 79.4                | 79.4       |           |                 |                 |                 | No        | No         | No       | Yes        |
| NOAA LIPID  | Lipid     | Lipids  | percent | 0.27                | 0.27       |           |                 |                 | 0.25            | No        | No         | No       | Yes        |



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|             |           |         | Sample  | EPA-NP-A4           |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|---------|---------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID  | K1807185-024        |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units   | Original Lab Result | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/g    | 345                 | 345        |           |                 | 0.45            | 5               | No        | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/g    | 0.02                | 0.02       | U         | UJ              | 0.007           | 0.02            | Yes       | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | mg/kg   | 0.62                | 0.62       | J         | J               | 0.30            | 0.99            | Yes       | No         | No       | Yes        |
|             | Calcium   | 7440702 | mg/kg   | 829                 | 829        |           |                 | 2.0             | 4.0             | No        | No         | No       | Yes        |
|             | Iron      | 7439896 | mg/kg   | 9.5                 | 9.5        |           | U*              | 9.5             | 9.5             | No        | Yes        | No       | Yes        |
|             | Magnesium | 7439954 | mg/kg   | 1370                | 1370       |           |                 | 0.60            | 0.99            | No        | No         | No       | Yes        |
|             | Potassium | 7440097 | mg/kg   | 19100               | 19100      |           |                 | 9               | 40              | No        | No         | No       | Yes        |
|             | Sodium    | 7440235 | mg/kg   | 1590                | 1590       |           |                 | 2               | 20              | No        | No         | No       | Yes        |
|             | Sulfur    | 7704349 | mg/kg   | 9470                | 9470       |           |                 | 1.0             | 7.9             | No        | No         | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | mg/kg   | 0.050               | 0.050      | U         | U               | 0.005           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | mg/kg   | 0.19                | 0.19       | J         | J               | 0.02            | 0.50            | Yes       | No         | No       | Yes        |
|             | Barium    | 7440393 | mg/kg   | 0.160               | 0.160      |           |                 | 0.020           | 0.050           | No        | No         | No       | Yes        |
|             | Beryllium | 7440417 | mg/kg   | 0.020               | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | mg/kg   | 0.004               | 0.004      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Chromium  | 7440473 | mg/kg   | 0.37                | 0.37       |           |                 | 0.02            | 0.20            | No        | No         | No       | Yes        |
|             | Cobalt    | 7440484 | mg/kg   | 0.016               | 0.016      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Copper    | 7440508 | mg/kg   | 1.30                | 1.30       |           | J               | 0.030           | 0.099           | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921 | mg/kg   | 0.007               | 0.007      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965 | mg/kg   | 0.909               | 0.909      |           | J               | 0.010           | 0.050           | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020 | mg/kg   | 0.17                | 0.17       | J         | J               | 0.02            | 0.20            | Yes       | No         | No       | Yes        |
|             | Silver    | 7440224 | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | mg/kg   | 0.070               | 0.070      |           |                 | 0.002           | 0.020           | No        | No         | No       | Yes        |
|             | Uranium   | 7440611 | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | mg/kg   | 0.20                | 0.20       | U         | U               | 0.02            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | mg/kg   | 20.8                | 20.8       |           | J               | 0.08            | 0.50            | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | mg/kg   | 1.49                | 1.49       |           | J-              | 0.050           | 0.099           | Yes       | No         | No       | Yes        |
| Freeze Dry  | Solids    |         | percent | 20.6                | 20.6       |           |                 |                 |                 | No        | No         | No       | Yes        |
| LabCalc     | Moisture  |         | percent | 79.4                | 79.4       |           |                 |                 |                 | No        | No         | No       | Yes        |
| NOAA LIPID  | Lipid     | Lipids  | percent | 0.44                | 0.44       |           |                 |                 | 0.24            | No        | No         | No       | Yes        |

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|             |           |         | Sample  | EPA-NP-A5           |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|---------|---------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID  | K1807185-030        |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units   | Original Lab Result | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/g    | 375                 | 375        |           |                 | 0.45            | 5               | No        | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/g    | 0.02                | 0.02       | U         | UJ              | 0.007           | 0.02            | Yes       | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | mg/kg   | 0.93                | 0.93       | J         | J               | 0.3             | 1.0             | Yes       | No         | No       | Yes        |
|             | Calcium   | 7440702 | mg/kg   | 1460                | 1460       |           |                 | 2.0             | 4.0             | No        | No         | No       | Yes        |
|             | Iron      | 7439896 | mg/kg   | 10.3                | 10.3       |           |                 | 1.0             | 8.0             | No        | No         | No       | Yes        |
|             | Magnesium | 7439954 | mg/kg   | 1400                | 1400       |           |                 | 0.6             | 1.0             | No        | No         | No       | Yes        |
|             | Potassium | 7440097 | mg/kg   | 19400               | 19400      |           |                 | 9               | 40              | No        | No         | No       | Yes        |
|             | Sodium    | 7440235 | mg/kg   | 1400                | 1400       |           |                 | 2               | 20              | No        | No         | No       | Yes        |
|             | Sulfur    | 7704349 | mg/kg   | 9490                | 9490       |           |                 | 1.0             | 8.0             | No        | No         | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | mg/kg   | 0.050               | 0.050      | U         | U               | 0.005           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | mg/kg   | 0.31                | 0.31       | J         | J               | 0.02            | 0.50            | Yes       | No         | No       | Yes        |
|             | Barium    | 7440393 | mg/kg   | 0.335               | 0.335      |           |                 | 0.020           | 0.050           | No        | No         | No       | Yes        |
|             | Beryllium | 7440417 | mg/kg   | 0.020               | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | mg/kg   | 0.011               | 0.011      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Chromium  | 7440473 | mg/kg   | 0.18                | 0.18       | J         | J               | 0.02            | 0.20            | Yes       | No         | No       | Yes        |
|             | Cobalt    | 7440484 | mg/kg   | 0.016               | 0.016      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Copper    | 7440508 | mg/kg   | 1.06                | 1.06       |           | J               | 0.03            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921 | mg/kg   | 0.011               | 0.011      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965 | mg/kg   | 1.23                | 1.23       |           | J               | 0.010           | 0.050           | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020 | mg/kg   | 0.08                | 0.08       | J         | J               | 0.02            | 0.20            | Yes       | No         | No       | Yes        |
|             | Silver    | 7440224 | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | mg/kg   | 0.073               | 0.073      |           |                 | 0.002           | 0.020           | No        | No         | No       | Yes        |
|             | Uranium   | 7440611 | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | mg/kg   | 0.20                | 0.20       | U         | U               | 0.02            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | mg/kg   | 21.3                | 21.3       |           | J               | 0.08            | 0.50            | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | mg/kg   | 2.01                | 2.01       |           | J-              | 0.05            | 0.10            | Yes       | No         | No       | Yes        |
| Freeze Dry  | Solids    |         | percent | 20.1                | 20.1       |           |                 |                 |                 | No        | No         | No       | Yes        |
| LabCalc     | Moisture  |         | percent | 79.9                | 79.9       |           |                 |                 |                 | No        | No         | No       | Yes        |
| NOAA LIPID  | Lipid     | Lipids  | percent | 0.49                | 0.49       |           |                 |                 | 0.24            | No        | No         | No       | Yes        |

**Teck American Incorporated**  
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|             |           |         | Sample  | EPA-NP-A6           |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|---------|---------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID  | K1807185-036        |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units   | Original Lab Result | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/g    | 425                 | 425        |           |                 | 0.44            | 4.9             | No        | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/g    | 0.02                | 0.02       | U         | UJ              | 0.007           | 0.02            | Yes       | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | mg/kg   | 1.36                | 1.36       |           |                 | 0.3             | 1.0             | No        | No         | No       | Yes        |
|             | Calcium   | 7440702 | mg/kg   | 2120                | 2120       |           |                 | 2.0             | 4.0             | No        | No         | No       | Yes        |
|             | Iron      | 7439896 | mg/kg   | 10.6                | 10.6       |           |                 | 1.0             | 8.0             | No        | No         | No       | Yes        |
|             | Magnesium | 7439954 | mg/kg   | 1430                | 1430       |           |                 | 0.6             | 1.0             | No        | No         | No       | Yes        |
|             | Potassium | 7440097 | mg/kg   | 19600               | 19600      |           |                 | 9               | 40              | No        | No         | No       | Yes        |
|             | Sodium    | 7440235 | mg/kg   | 1800                | 1800       |           |                 | 2               | 20              | No        | No         | No       | Yes        |
|             | Sulfur    | 7704349 | mg/kg   | 9520                | 9520       |           |                 | 1.0             | 8.0             | No        | No         | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | mg/kg   | 0.005               | 0.005      | J         | J               | 0.005           | 0.050           | Yes       | No         | No       | Yes        |
|             | Arsenic   | 7440382 | mg/kg   | 0.24                | 0.24       | J         | J               | 0.02            | 0.50            | Yes       | No         | No       | Yes        |
|             | Barium    | 7440393 | mg/kg   | 0.304               | 0.304      |           |                 | 0.020           | 0.050           | No        | No         | No       | Yes        |
|             | Beryllium | 7440417 | mg/kg   | 0.020               | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | mg/kg   | 0.005               | 0.005      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Chromium  | 7440473 | mg/kg   | 0.29                | 0.29       |           |                 | 0.02            | 0.20            | No        | No         | No       | Yes        |
|             | Cobalt    | 7440484 | mg/kg   | 0.018               | 0.018      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Copper    | 7440508 | mg/kg   | 2.07                | 2.07       |           | J               | 0.03            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921 | mg/kg   | 0.010               | 0.010      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965 | mg/kg   | 1.57                | 1.57       |           | J               | 0.010           | 0.050           | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020 | mg/kg   | 0.14                | 0.14       | J         | J               | 0.02            | 0.20            | Yes       | No         | No       | Yes        |
|             | Silver    | 7440224 | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | mg/kg   | 0.075               | 0.075      |           |                 | 0.002           | 0.020           | No        | No         | No       | Yes        |
|             | Uranium   | 7440611 | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | mg/kg   | 0.20                | 0.20       | U         | U               | 0.02            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | mg/kg   | 23.3                | 23.3       |           | J               | 0.08            | 0.50            | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | mg/kg   | 2.24                | 2.24       |           | J-              | 0.05            | 0.10            | Yes       | No         | No       | Yes        |
| Freeze Dry  | Solids    |         | percent | 20.4                | 20.4       |           |                 |                 |                 | No        | No         | No       | Yes        |
| LabCalc     | Moisture  |         | percent | 79.6                | 79.6       |           |                 |                 |                 | No        | No         | No       | Yes        |
| NOAA LIPID  | Lipid     | Lipids  | percent | 0.25                | 0.25       |           |                 |                 | 0.25            | No        | No         | No       | Yes        |

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|             |           |         |         | Sample EPA-NP-A6       |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|---------|------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         |         | Lab ID K1807185-036DUP |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units   | Original Lab Result    | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/g    |                        |            |           |                 |                 |                 |           |            |          |            |
| EPA1632A    | As_inorg  | 7440382 | ug/g    | 0.007                  | 0.007      | J         | J               | 0.007           | 0.02            | Yes       | No         | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Calcium   | 7440702 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Iron      | 7439896 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Magnesium | 7439954 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Potassium | 7440097 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Sodium    | 7440235 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Sulfur    | 7704349 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
| EPA6020A    | Antimony  | 7440360 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Arsenic   | 7440382 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Barium    | 7440393 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Beryllium | 7440417 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Cadmium   | 7440439 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Chromium  | 7440473 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Cobalt    | 7440484 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Copper    | 7440508 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Lead      | 7439921 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Manganese | 7439965 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Nickel    | 7440020 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Silver    | 7440224 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Thallium  | 7440280 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Uranium   | 7440611 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Vanadium  | 7440622 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Zinc      | 7440666 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
| EPA7742     | Selenium  | 7782492 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
| Freeze Dry  | Solids    |         | percent |                        |            |           |                 |                 |                 |           |            |          |            |
| LabCalc     | Moisture  |         | percent |                        |            |           |                 |                 |                 |           |            |          |            |
| NOAA LIPID  | Lipid     | Lipids  | percent |                        |            |           |                 |                 |                 |           |            |          |            |

**Teck American Incorporated**  
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|             |           |         |         | Sample EPA-NP-A6       |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|---------|------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         |         | Lab ID K1807185-036TRP |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units   | Original Lab Result    | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/g    |                        |            |           |                 |                 |                 |           |            |          |            |
| EPA1632A    | As_inorg  | 7440382 | ug/g    | 0.02                   | 0.02       | U         | UJ              | 0.007           | 0.02            | Yes       | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Calcium   | 7440702 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Iron      | 7439896 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Magnesium | 7439954 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Potassium | 7440097 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Sodium    | 7440235 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Sulfur    | 7704349 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
| EPA6020A    | Antimony  | 7440360 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Arsenic   | 7440382 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Barium    | 7440393 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Beryllium | 7440417 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Cadmium   | 7440439 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Chromium  | 7440473 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Cobalt    | 7440484 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Copper    | 7440508 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Lead      | 7439921 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Manganese | 7439965 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Nickel    | 7440020 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Silver    | 7440224 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Thallium  | 7440280 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Uranium   | 7440611 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Vanadium  | 7440622 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
|             | Zinc      | 7440666 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
| EPA7742     | Selenium  | 7782492 | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
| Freeze Dry  | Solids    |         | percent |                        |            |           |                 |                 |                 |           |            |          |            |
| LabCalc     | Moisture  |         | percent |                        |            |           |                 |                 |                 |           |            |          |            |
| NOAA LIPID  | Lipid     | Lipids  | percent |                        |            |           |                 |                 |                 |           |            |          |            |

**B. SERVICE REQUEST K1807189**

**Teck American Incorporated**  
**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807189**

|             |           |          | Sample  | EPA-NP-B1           |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|----------|---------|---------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |          | Lab ID  | K1807189-006        |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No   | Units   | Original Lab Result | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976  | ng/g    | 326                 | 326        |           |                 | 0.45            | 5               | No        | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382  | ug/g    | 0.02                | 0.02       | U         | UJ              | 0.007           | 0.02            | Yes       | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905  | mg/kg   | 0.99                | 0.99       | U         | U               | 0.30            | 0.99            | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702  | mg/kg   | 730                 | 730        |           |                 | 2.0             | 4.0             | No        | No         | No       | Yes        |
|             | Iron      | 7439896  | mg/kg   | 9.4                 | 9.4        |           | U*              | 9.4             | 9.4             | No        | Yes        | No       | Yes        |
|             | Magnesium | 7439954  | mg/kg   | 1350                | 1350       |           |                 | 0.60            | 0.99            | No        | No         | No       | Yes        |
|             | Potassium | 7440097  | mg/kg   | 19200               | 19200      |           |                 | 9               | 40              | No        | No         | No       | Yes        |
|             | Sodium    | 7440235  | mg/kg   | 1500                | 1500       |           |                 | 2               | 20              | No        | No         | No       | Yes        |
|             | Sulfur    | 63705055 | mg/kg   | 9370                | 9370       |           |                 | 1.0             | 7.9             | No        | No         | No       | Yes        |
| EPA6020A    | Antimony  | 7440360  | mg/kg   | 0.050               | 0.050      | U         | U               | 0.005           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382  | mg/kg   | 0.42                | 0.42       | J         | J               | 0.02            | 0.50            | Yes       | No         | No       | Yes        |
|             | Barium    | 7440393  | mg/kg   | 0.165               | 0.165      |           |                 | 0.020           | 0.050           | No        | No         | No       | Yes        |
|             | Beryllium | 7440417  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439  | mg/kg   | 0.004               | 0.004      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Chromium  | 7440473  | mg/kg   | 0.26                | 0.26       |           |                 | 0.02            | 0.20            | No        | No         | No       | Yes        |
|             | Cobalt    | 7440484  | mg/kg   | 0.014               | 0.014      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Copper    | 7440508  | mg/kg   | 1.27                | 1.27       |           | J               | 0.030           | 0.099           | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921  | mg/kg   | 0.008               | 0.008      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965  | mg/kg   | 1.04                | 1.04       |           | J               | 0.010           | 0.050           | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020  | mg/kg   | 0.15                | 0.15       | J         | J               | 0.02            | 0.20            | Yes       | No         | No       | Yes        |
|             | Silver    | 7440224  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280  | mg/kg   | 0.043               | 0.043      |           |                 | 0.002           | 0.020           | No        | No         | No       | Yes        |
|             | Uranium   | 7440611  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622  | mg/kg   | 0.20                | 0.20       | U         | U               | 0.02            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666  | mg/kg   | 20.3                | 20.3       |           | J               | 0.08            | 0.50            | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492  | mg/kg   | 3.40                | 3.40       |           | J-              | 0.050           | 0.099           | Yes       | No         | No       | Yes        |
| Freeze Dry  | Solids    |          | percent | 20.7                | 20.7       |           |                 |                 |                 | No        | No         | No       | Yes        |
| LabCalc     | Moisture  |          | percent | 79.3                | 79.3       |           |                 |                 |                 | No        | No         | No       | Yes        |
| NOAA LIPID  | Lipid     | Lipid    | percent | 0.35                | 0.35       |           |                 |                 | 0.25            | No        | No         | No       | Yes        |

**Teck American Incorporated**  
**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807189**

|             |           |          | <b>Sample</b> | EPA-NP-B1           |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|----------|---------------|---------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |          | <b>Lab ID</b> | K1807189-006DUP     |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No   | Units         | Original Lab Result | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976  | ng/g          |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA1632A    | As_inorg  | 7440382  | ug/g          |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA6010C    | Aluminum  | 7429905  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Calcium   | 7440702  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Iron      | 7439896  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Magnesium | 7439954  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Potassium | 7440097  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Sodium    | 7440235  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Sulfur    | 63705055 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA6020A    | Antimony  | 7440360  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Arsenic   | 7440382  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Barium    | 7440393  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Beryllium | 7440417  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Cadmium   | 7440439  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Chromium  | 7440473  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Cobalt    | 7440484  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Copper    | 7440508  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Lead      | 7439921  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Manganese | 7439965  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Nickel    | 7440020  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Silver    | 7440224  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Thallium  | 7440280  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Uranium   | 7440611  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Vanadium  | 7440622  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Zinc      | 7440666  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA7742     | Selenium  | 7782492  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
| Freeze Dry  | Solids    |          | percent       | 21.1                | 21.1       |           |                 |                 |                 | No        | No         | No       | Yes        |
| LabCalc     | Moisture  |          | percent       |                     |            |           |                 |                 |                 |           |            |          |            |
| NOAA LIPID  | Lipid     | Lipid    | percent       | 0.35                | 0.35       |           |                 |                 | 0.25            | No        | No         | No       | Yes        |



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|             |           |          | <b>Sample</b> | EPA-NP-B1           |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|----------|---------------|---------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |          | <b>Lab ID</b> | K1807189-006TPL     |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No   | Units         | Original Lab Result | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976  | ng/g          |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA1632A    | As_inorg  | 7440382  | ug/g          |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA6010C    | Aluminum  | 7429905  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Calcium   | 7440702  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Iron      | 7439896  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Magnesium | 7439954  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Potassium | 7440097  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Sodium    | 7440235  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Sulfur    | 63705055 | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA6020A    | Antimony  | 7440360  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Arsenic   | 7440382  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Barium    | 7440393  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Beryllium | 7440417  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Cadmium   | 7440439  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Chromium  | 7440473  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Cobalt    | 7440484  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Copper    | 7440508  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Lead      | 7439921  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Manganese | 7439965  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Nickel    | 7440020  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Silver    | 7440224  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Thallium  | 7440280  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Uranium   | 7440611  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Vanadium  | 7440622  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Zinc      | 7440666  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA7742     | Selenium  | 7782492  | mg/kg         |                     |            |           |                 |                 |                 |           |            |          |            |
| Freeze Dry  | Solids    |          | percent       |                     |            |           |                 |                 |                 |           |            |          |            |
| LabCalc     | Moisture  |          | percent       |                     |            |           |                 |                 |                 |           |            |          |            |
| NOAA LIPID  | Lipid     | Lipid    | percent       | 0.47                | 0.47       |           |                 |                 | 0.25            | No        | No         | No       | Yes        |

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|             |           |          |         | Sample EPA-NP-B1    |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|----------|---------|---------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |          |         | Lab ID KQ1811997-08 |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No   | Units   | Original Lab Result | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976  | ng/g    |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA1632A    | As_inorg  | 7440382  | ug/g    |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA6010C    | Aluminum  | 7429905  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Calcium   | 7440702  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Iron      | 7439896  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Magnesium | 7439954  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Potassium | 7440097  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Sodium    | 7440235  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Sulfur    | 63705055 | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA6020A    | Antimony  | 7440360  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Arsenic   | 7440382  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Barium    | 7440393  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Beryllium | 7440417  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Cadmium   | 7440439  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Chromium  | 7440473  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Cobalt    | 7440484  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Copper    | 7440508  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Lead      | 7439921  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Manganese | 7439965  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Nickel    | 7440020  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Silver    | 7440224  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Thallium  | 7440280  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Uranium   | 7440611  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Vanadium  | 7440622  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
|             | Zinc      | 7440666  | mg/kg   |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA7742     | Selenium  | 7782492  | mg/kg   | 3.74                | 3.74       |           | J-              | 0.05            | 0.10            | Yes       | No         | No       | Yes        |
| Freeze Dry  | Solids    |          | percent |                     |            |           |                 |                 |                 |           |            |          |            |
| LabCalc     | Moisture  |          | percent |                     |            |           |                 |                 |                 |           |            |          |            |
| NOAA LIPID  | Lipid     | Lipid    | percent |                     |            |           |                 |                 |                 |           |            |          |            |

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|             |           |          |         | Sample EPA-NP-B1       |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|----------|---------|------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |          |         | Lab ID KQ1811997-08DUP |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No   | Units   | Original Lab Result    | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976  | ng/g    |                        |            |           |                 |                 |                 |           |            |          |            |
| EPA1632A    | As_inorg  | 7440382  | ug/g    |                        |            |           |                 |                 |                 |           |            |          |            |
| EPA6010C    | Aluminum  | 7429905  | mg/kg   | 0.4                    | 0.4        | J         | J               | 0.3             | 1               | Yes       | No         | No       | Yes        |
|             | Calcium   | 7440702  | mg/kg   | 1120                   | 1120       | *         |                 | 2.0             | 4               | No        | No         | No       | Yes        |
|             | Iron      | 7439896  | mg/kg   | 10.1                   | 10.1       |           |                 | 1.0             | 8               | No        | No         | No       | Yes        |
|             | Magnesium | 7439954  | mg/kg   | 1370                   | 1370       |           |                 | 0.6             | 1               | No        | No         | No       | Yes        |
|             | Potassium | 7440097  | mg/kg   | 19500                  | 19500      |           |                 | 9               | 40              | No        | No         | No       | Yes        |
|             | Sodium    | 7440235  | mg/kg   | 1510                   | 1510       |           |                 | 2               | 20              | No        | No         | No       | Yes        |
|             | Sulfur    | 63705055 | mg/kg   | 9440                   | 9440       |           |                 | 1.0             | 8               | No        | No         | No       | Yes        |
| EPA6020A    | Antimony  | 7440360  | mg/kg   | 0.05                   | 0.05       | U         | U               | 0.005           | 0.05            | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382  | mg/kg   | 0.41                   | 0.41       | J         | J               | 0.02            | 0.5             | Yes       | No         | No       | Yes        |
|             | Barium    | 7440393  | mg/kg   | 0.162                  | 0.162      |           |                 | 0.020           | 0.05            | No        | No         | No       | Yes        |
|             | Beryllium | 7440417  | mg/kg   | 0.020                  | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439  | mg/kg   | 0.004                  | 0.004      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Chromium  | 7440473  | mg/kg   | 0.26                   | 0.26       |           |                 | 0.02            | 0.20            | No        | No         | No       | Yes        |
|             | Cobalt    | 7440484  | mg/kg   | 0.011                  | 0.011      | #,J       | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Copper    | 7440508  | mg/kg   | 1.34                   | 1.34       |           | J               | 0.03            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921  | mg/kg   | 0.007                  | 0.007      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965  | mg/kg   | 1.15                   | 1.15       |           | J               | 0.010           | 0.05            | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020  | mg/kg   | 0.14                   | 0.14       | J         | J               | 0.02            | 0.20            | Yes       | No         | No       | Yes        |
|             | Silver    | 7440224  | mg/kg   | 0.002                  | 0.002      | J         | J               | 0.002           | 0.020           | Yes       | No         | No       | Yes        |
|             | Thallium  | 7440280  | mg/kg   | 0.044                  | 0.044      |           |                 | 0.002           | 0.020           | No        | No         | No       | Yes        |
|             | Uranium   | 7440611  | mg/kg   | 0.020                  | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622  | mg/kg   | 0.20                   | 0.20       | U         | U               | 0.02            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666  | mg/kg   | 20.6                   | 20.6       |           | J               | 0.08            | 0.5             | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492  | mg/kg   |                        |            |           |                 |                 |                 |           |            |          |            |
| Freeze Dry  | Solids    |          | percent |                        |            |           |                 |                 |                 |           |            |          |            |
| LabCalc     | Moisture  |          | percent |                        |            |           |                 |                 |                 |           |            |          |            |
| NOAA LIPID  | Lipid     | Lipid    | percent |                        |            |           |                 |                 |                 |           |            |          |            |

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|             |           |          | Sample  | EPA-NP-B1           |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|----------|---------|---------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |          | Lab ID  | KQ1811997-09TPL     |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No   | Units   | Original Lab Result | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976  | ng/g    |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA1632A    | As_inorg  | 7440382  | ug/g    |                     |            |           |                 |                 |                 |           |            |          |            |
| EPA6010C    | Aluminum  | 7429905  | mg/kg   | 0.50                | 0.50       | J         | J               | 0.3             | 1.0             | Yes       | No         | No       | Yes        |
|             | Calcium   | 7440702  | mg/kg   | 1340                | 1340       | *         |                 | 2.0             | 4               | No        | No         | No       | Yes        |
|             | Iron      | 7439896  | mg/kg   | 10.0                | 10.0       |           |                 | 1.0             | 8               | No        | No         | No       | Yes        |
|             | Magnesium | 7439954  | mg/kg   | 1360                | 1360       |           |                 | 0.6             | 1.0             | No        | No         | No       | Yes        |
|             | Potassium | 7440097  | mg/kg   | 19300               | 19300      |           |                 | 9               | 40              | No        | No         | No       | Yes        |
|             | Sodium    | 7440235  | mg/kg   | 1500                | 1500       |           |                 | 2               | 20              | No        | No         | No       | Yes        |
|             | Sulfur    | 63705055 | mg/kg   | 9360                | 9360       |           |                 | 1.0             | 8               | No        | No         | No       | Yes        |
| EPA6020A    | Antimony  | 7440360  | mg/kg   | 0.05                | 0.05       | U         | U               | 0.005           | 0.05            | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382  | mg/kg   | 0.42                | 0.42       | J         | J               | 0.02            | 0.5             | Yes       | No         | No       | Yes        |
|             | Barium    | 7440393  | mg/kg   | 0.234               | 0.234      | #         |                 | 0.020           | 0.05            | No        | No         | No       | Yes        |
|             | Beryllium | 7440417  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439  | mg/kg   | 0.003               | 0.003      | #,J       | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Chromium  | 7440473  | mg/kg   | 0.28                | 0.28       |           |                 | 0.02            | 0.20            | No        | No         | No       | Yes        |
|             | Cobalt    | 7440484  | mg/kg   | 0.014               | 0.014      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Copper    | 7440508  | mg/kg   | 1.30                | 1.30       |           | J               | 0.03            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921  | mg/kg   | 0.008               | 0.008      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965  | mg/kg   | 1.31                | 1.31       | *         | J               | 0.010           | 0.05            | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020  | mg/kg   | 0.14                | 0.14       | J         | J               | 0.02            | 0.20            | Yes       | No         | No       | Yes        |
|             | Silver    | 7440224  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280  | mg/kg   | 0.047               | 0.047      |           |                 | 0.002           | 0.020           | No        | No         | No       | Yes        |
|             | Uranium   | 7440611  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622  | mg/kg   | 0.20                | 0.20       | U         | U               | 0.02            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666  | mg/kg   | 21.3                | 21.3       |           | J               | 0.08            | 0.5             | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492  | mg/kg   | 3.38                | 3.38       |           | J-              | 0.05            | 0.10            | Yes       | No         | No       | Yes        |
| Freeze Dry  | Solids    |          | percent |                     |            |           |                 |                 |                 |           |            |          |            |
| LabCalc     | Moisture  |          | percent |                     |            |           |                 |                 |                 |           |            |          |            |
| NOAA LIPID  | Lipid     | Lipid    | percent |                     |            |           |                 |                 |                 |           |            |          |            |

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|             |           |          | Sample  | EPA-NP-B2           |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|----------|---------|---------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |          | Lab ID  | K1807189-012        |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No   | Units   | Original Lab Result | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976  | ng/g    | 484                 | 484        |           |                 | 0.44            | 4.8             | No        | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382  | ug/g    | 0.019               | 0.019      | U         | UJ              | 0.007           | 0.019           | Yes       | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905  | mg/kg   | 0.7                 | 0.7        | J         | J               | 0.3             | 1.0             | Yes       | No         | No       | Yes        |
|             | Calcium   | 7440702  | mg/kg   | 1400                | 1400       |           |                 | 2.0             | 4.0             | No        | No         | No       | Yes        |
|             | Iron      | 7439896  | mg/kg   | 11.3                | 11.3       |           |                 | 1.0             | 8.0             | No        | No         | No       | Yes        |
|             | Magnesium | 7439954  | mg/kg   | 1350                | 1350       |           |                 | 0.6             | 1.0             | No        | No         | No       | Yes        |
|             | Potassium | 7440097  | mg/kg   | 18700               | 18700      |           |                 | 9               | 40              | No        | No         | No       | Yes        |
|             | Sodium    | 7440235  | mg/kg   | 1800                | 1800       |           |                 | 2               | 20              | No        | No         | No       | Yes        |
|             | Sulfur    | 63705055 | mg/kg   | 9280                | 9280       |           |                 | 1.0             | 8.0             | No        | No         | No       | Yes        |
| EPA6020A    | Antimony  | 7440360  | mg/kg   | 0.050               | 0.050      | U         | U               | 0.005           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382  | mg/kg   | 0.32                | 0.32       | J         | J               | 0.02            | 0.50            | Yes       | No         | No       | Yes        |
|             | Barium    | 7440393  | mg/kg   | 0.217               | 0.217      |           |                 | 0.020           | 0.050           | No        | No         | No       | Yes        |
|             | Beryllium | 7440417  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439  | mg/kg   | 0.006               | 0.006      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Chromium  | 7440473  | mg/kg   | 0.67                | 0.67       |           |                 | 0.02            | 0.20            | No        | No         | No       | Yes        |
|             | Cobalt    | 7440484  | mg/kg   | 0.025               | 0.025      |           |                 | 0.003           | 0.020           | No        | No         | No       | Yes        |
|             | Copper    | 7440508  | mg/kg   | 1.10                | 1.10       |           | J               | 0.03            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921  | mg/kg   | 0.009               | 0.009      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965  | mg/kg   | 1.43                | 1.43       |           | J               | 0.010           | 0.050           | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020  | mg/kg   | 0.31                | 0.31       |           |                 | 0.02            | 0.20            | No        | No         | No       | Yes        |
|             | Silver    | 7440224  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280  | mg/kg   | 0.058               | 0.058      |           |                 | 0.002           | 0.020           | No        | No         | No       | Yes        |
|             | Uranium   | 7440611  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622  | mg/kg   | 0.20                | 0.20       | U         | U               | 0.02            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666  | mg/kg   | 21.0                | 21.0       |           | J               | 0.08            | 0.50            | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492  | mg/kg   | 3.59                | 3.59       |           | J-              | 0.05            | 0.10            | Yes       | No         | No       | Yes        |
| Freeze Dry  | Solids    |          | percent | 21.5                | 21.5       |           |                 |                 |                 | No        | No         | No       | Yes        |
| LabCalc     | Moisture  |          | percent | 78.5                | 78.5       |           |                 |                 |                 | No        | No         | No       | Yes        |
| NOAA LIPID  | Lipid     | Lipid    | percent | 0.43                | 0.43       |           |                 |                 | 0.24            | No        | No         | No       | Yes        |

**Teck American Incorporated**  
**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807189**

|             |           |          | Sample  | EPA-NP-B3           |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|----------|---------|---------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |          | Lab ID  | K1807189-018        |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No   | Units   | Original Lab Result | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976  | ng/g    | 528                 | 528        |           |                 | 0.44            | 4.9             | No        | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382  | ug/g    | 0.02                | 0.02       | U         | UJ              | 0.007           | 0.02            | Yes       | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905  | mg/kg   | 1.0                 | 1.0        | U         | U               | 0.3             | 1.0             | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702  | mg/kg   | 881                 | 881        |           |                 | 2.0             | 4.0             | No        | No         | No       | Yes        |
|             | Iron      | 7439896  | mg/kg   | 9.4                 | 9.4        |           | U*              | 9.4             | 9.4             | No        | Yes        | No       | Yes        |
|             | Magnesium | 7439954  | mg/kg   | 1320                | 1320       |           |                 | 0.6             | 1.0             | No        | No         | No       | Yes        |
|             | Potassium | 7440097  | mg/kg   | 18300               | 18300      |           |                 | 9               | 40              | No        | No         | No       | Yes        |
|             | Sodium    | 7440235  | mg/kg   | 1650                | 1650       |           |                 | 2               | 20              | No        | No         | No       | Yes        |
|             | Sulfur    | 63705055 | mg/kg   | 9430                | 9430       |           |                 | 1.0             | 8.0             | No        | No         | No       | Yes        |
| EPA6020A    | Antimony  | 7440360  | mg/kg   | 0.050               | 0.050      | U         | U               | 0.005           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382  | mg/kg   | 0.39                | 0.39       | J         | J               | 0.02            | 0.50            | Yes       | No         | No       | Yes        |
|             | Barium    | 7440393  | mg/kg   | 0.133               | 0.133      |           |                 | 0.020           | 0.050           | No        | No         | No       | Yes        |
|             | Beryllium | 7440417  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439  | mg/kg   | 0.004               | 0.004      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Chromium  | 7440473  | mg/kg   | 0.36                | 0.36       |           |                 | 0.02            | 0.20            | No        | No         | No       | Yes        |
|             | Cobalt    | 7440484  | mg/kg   | 0.014               | 0.014      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Copper    | 7440508  | mg/kg   | 0.95                | 0.95       |           | J               | 0.03            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921  | mg/kg   | 0.007               | 0.007      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965  | mg/kg   | 0.795               | 0.795      |           | J               | 0.010           | 0.050           | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020  | mg/kg   | 0.15                | 0.15       | J         | J               | 0.02            | 0.20            | Yes       | No         | No       | Yes        |
|             | Silver    | 7440224  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280  | mg/kg   | 0.048               | 0.048      |           |                 | 0.002           | 0.020           | No        | No         | No       | Yes        |
|             | Uranium   | 7440611  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622  | mg/kg   | 0.20                | 0.20       | U         | U               | 0.02            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666  | mg/kg   | 20.4                | 20.4       |           | J               | 0.08            | 0.50            | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492  | mg/kg   | 3.06                | 3.06       |           | J-              | 0.05            | 0.10            | Yes       | No         | No       | Yes        |
| Freeze Dry  | Solids    |          | percent | 21.2                | 21.2       |           |                 |                 |                 | No        | No         | No       | Yes        |
| LabCalc     | Moisture  |          | percent | 78.8                | 78.8       |           |                 |                 |                 | No        | No         | No       | Yes        |
| NOAA LIPID  | Lipid     | Lipid    | percent | 0.62                | 0.62       |           |                 |                 | 0.25            | No        | No         | No       | Yes        |

**Teck American Incorporated**  
**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807189**

|             |           |          | Sample  | EPA-NP-B4           |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|----------|---------|---------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |          | Lab ID  | K1807189-024        |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No   | Units   | Original Lab Result | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976  | ng/g    | 604                 | 604        |           |                 | 0.45            | 5               | No        | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382  | ug/g    | 0.02                | 0.02       | U         | UJ              | 0.007           | 0.02            | Yes       | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905  | mg/kg   | 1.42                | 1.42       |           |                 | 0.3             | 1.0             | No        | No         | No       | Yes        |
|             | Calcium   | 7440702  | mg/kg   | 671                 | 671        |           |                 | 2.0             | 4.0             | No        | No         | No       | Yes        |
|             | Iron      | 7439896  | mg/kg   | 11.4                | 11.4       |           |                 | 1.0             | 8.0             | No        | No         | No       | Yes        |
|             | Magnesium | 7439954  | mg/kg   | 1340                | 1340       |           |                 | 0.6             | 1.0             | No        | No         | No       | Yes        |
|             | Potassium | 7440097  | mg/kg   | 19100               | 19100      |           |                 | 9               | 40              | No        | No         | No       | Yes        |
|             | Sodium    | 7440235  | mg/kg   | 1920                | 1920       |           |                 | 2               | 20              | No        | No         | No       | Yes        |
|             | Sulfur    | 63705055 | mg/kg   | 9650                | 9650       |           |                 | 1.0             | 8.0             | No        | No         | No       | Yes        |
| EPA6020A    | Antimony  | 7440360  | mg/kg   | 0.050               | 0.050      | U         | U               | 0.005           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382  | mg/kg   | 0.40                | 0.40       | J         | J               | 0.02            | 0.50            | Yes       | No         | No       | Yes        |
|             | Barium    | 7440393  | mg/kg   | 0.140               | 0.140      |           |                 | 0.020           | 0.050           | No        | No         | No       | Yes        |
|             | Beryllium | 7440417  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439  | mg/kg   | 0.004               | 0.004      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Chromium  | 7440473  | mg/kg   | 0.83                | 0.83       |           |                 | 0.02            | 0.20            | No        | No         | No       | Yes        |
|             | Cobalt    | 7440484  | mg/kg   | 0.022               | 0.022      |           |                 | 0.003           | 0.020           | No        | No         | No       | Yes        |
|             | Copper    | 7440508  | mg/kg   | 1.11                | 1.11       |           | J               | 0.03            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921  | mg/kg   | 0.092               | 0.092      |           |                 | 0.003           | 0.020           | No        | No         | No       | Yes        |
|             | Manganese | 7439965  | mg/kg   | 0.756               | 0.756      |           | J               | 0.010           | 0.050           | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020  | mg/kg   | 0.40                | 0.40       |           |                 | 0.02            | 0.20            | No        | No         | No       | Yes        |
|             | Silver    | 7440224  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280  | mg/kg   | 0.047               | 0.047      |           |                 | 0.002           | 0.020           | No        | No         | No       | Yes        |
|             | Uranium   | 7440611  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622  | mg/kg   | 0.20                | 0.20       | U         | U               | 0.02            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666  | mg/kg   | 19.5                | 19.5       |           | J               | 0.08            | 0.50            | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492  | mg/kg   | 2.61                | 2.61       |           | J-              | 0.05            | 0.10            | Yes       | No         | No       | Yes        |
| Freeze Dry  | Solids    |          | percent | 21.3                | 21.3       |           |                 |                 |                 | No        | No         | No       | Yes        |
| LabCalc     | Moisture  |          | percent | 78.7                | 78.7       |           |                 |                 |                 | No        | No         | No       | Yes        |
| NOAA LIPID  | Lipid     | Lipid    | percent | 0.49                | 0.49       |           |                 |                 | 0.24            | No        | No         | No       | Yes        |

**Teck American Incorporated**  
**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807189**

|             |           |          | Sample  | EPA-NP-B5           |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|----------|---------|---------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |          | Lab ID  | K1807189-030        |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No   | Units   | Original Lab Result | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976  | ng/g    | 412                 | 412        |           |                 | 0.45            | 5               | No        | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382  | ug/g    | 0.019               | 0.019      | U         | UJ              | 0.007           | 0.019           | Yes       | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905  | mg/kg   | 2.13                | 2.13       |           |                 | 0.3             | 1.0             | No        | No         | No       | Yes        |
|             | Calcium   | 7440702  | mg/kg   | 1640                | 1640       |           |                 | 2.0             | 4.0             | No        | No         | No       | Yes        |
|             | Iron      | 7439896  | mg/kg   | 14.8                | 14.8       |           |                 | 1.0             | 8.0             | No        | No         | No       | Yes        |
|             | Magnesium | 7439954  | mg/kg   | 1380                | 1380       |           |                 | 0.6             | 1.0             | No        | No         | No       | Yes        |
|             | Potassium | 7440097  | mg/kg   | 18900               | 18900      |           |                 | 9               | 40              | No        | No         | No       | Yes        |
|             | Sodium    | 7440235  | mg/kg   | 1730                | 1730       |           |                 | 2               | 20              | No        | No         | No       | Yes        |
|             | Sulfur    | 63705055 | mg/kg   | 9600                | 9600       |           |                 | 1.0             | 8.0             | No        | No         | No       | Yes        |
| EPA6020A    | Antimony  | 7440360  | mg/kg   | 0.050               | 0.050      | U         | U               | 0.005           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382  | mg/kg   | 0.56                | 0.56       |           |                 | 0.02            | 0.50            | No        | No         | No       | Yes        |
|             | Barium    | 7440393  | mg/kg   | 0.207               | 0.207      |           |                 | 0.020           | 0.050           | No        | No         | No       | Yes        |
|             | Beryllium | 7440417  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439  | mg/kg   | 0.005               | 0.005      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Chromium  | 7440473  | mg/kg   | 0.33                | 0.33       |           |                 | 0.02            | 0.20            | No        | No         | No       | Yes        |
|             | Cobalt    | 7440484  | mg/kg   | 0.017               | 0.017      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Copper    | 7440508  | mg/kg   | 1.05                | 1.05       |           | J               | 0.03            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921  | mg/kg   | 0.011               | 0.011      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965  | mg/kg   | 1.36                | 1.36       |           | J               | 0.010           | 0.050           | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020  | mg/kg   | 0.15                | 0.15       | J         | J               | 0.02            | 0.20            | Yes       | No         | No       | Yes        |
|             | Silver    | 7440224  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280  | mg/kg   | 0.052               | 0.052      |           |                 | 0.002           | 0.020           | No        | No         | No       | Yes        |
|             | Uranium   | 7440611  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622  | mg/kg   | 0.20                | 0.20       | U         | U               | 0.02            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666  | mg/kg   | 21.3                | 21.3       |           | J               | 0.08            | 0.50            | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492  | mg/kg   | 2.74                | 2.74       |           | J-              | 0.05            | 0.10            | Yes       | No         | No       | Yes        |
| Freeze Dry  | Solids    |          | percent | 21.4                | 21.4       |           |                 |                 |                 | No        | No         | No       | Yes        |
| LabCalc     | Moisture  |          | percent | 78.6                | 78.6       |           |                 |                 |                 | No        | No         | No       | Yes        |
| NOAA LIPID  | Lipid     | Lipid    | percent | 0.64                | 0.64       |           |                 |                 | 0.24            | No        | No         | No       | Yes        |



**Teck American Incorporated**  
**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807189**

|             |           |          | Sample  | EPA-NP-B6           |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|----------|---------|---------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |          | Lab ID  | K1807189-036        |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No   | Units   | Original Lab Result | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976  | ng/g    | 964                 | 964        |           |                 | 0.44            | 4.9             | No        | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382  | ug/g    | 0.019               | 0.019      | U         | UJ              | 0.007           | 0.019           | Yes       | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905  | mg/kg   | 3.70                | 3.70       |           |                 | 0.3             | 1.0             | No        | No         | No       | Yes        |
|             | Calcium   | 7440702  | mg/kg   | 713                 | 713        |           |                 | 2.0             | 4.0             | No        | No         | No       | Yes        |
|             | Iron      | 7439896  | mg/kg   | 14.8                | 14.8       |           |                 | 1.0             | 8.0             | No        | No         | No       | Yes        |
|             | Magnesium | 7439954  | mg/kg   | 1330                | 1330       |           |                 | 0.6             | 1.0             | No        | No         | No       | Yes        |
|             | Potassium | 7440097  | mg/kg   | 18800               | 18800      |           |                 | 9               | 40              | No        | No         | No       | Yes        |
|             | Sodium    | 7440235  | mg/kg   | 1830                | 1830       |           |                 | 2               | 20              | No        | No         | No       | Yes        |
|             | Sulfur    | 63705055 | mg/kg   | 9440                | 9440       |           |                 | 1.0             | 8.0             | No        | No         | No       | Yes        |
| EPA6020A    | Antimony  | 7440360  | mg/kg   | 0.050               | 0.050      | U         | U               | 0.005           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382  | mg/kg   | 0.25                | 0.25       | J         | J               | 0.02            | 0.50            | Yes       | No         | No       | Yes        |
|             | Barium    | 7440393  | mg/kg   | 0.257               | 0.257      |           |                 | 0.020           | 0.050           | No        | No         | No       | Yes        |
|             | Beryllium | 7440417  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439  | mg/kg   | 0.006               | 0.006      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Chromium  | 7440473  | mg/kg   | 0.27                | 0.27       |           |                 | 0.02            | 0.20            | No        | No         | No       | Yes        |
|             | Cobalt    | 7440484  | mg/kg   | 0.018               | 0.018      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Copper    | 7440508  | mg/kg   | 1.73                | 1.73       |           | J               | 0.03            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921  | mg/kg   | 0.013               | 0.013      | J         | J               | 0.003           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965  | mg/kg   | 0.828               | 0.828      |           | J               | 0.010           | 0.050           | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020  | mg/kg   | 0.13                | 0.13       | J         | J               | 0.02            | 0.20            | Yes       | No         | No       | Yes        |
|             | Silver    | 7440224  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280  | mg/kg   | 0.053               | 0.053      |           |                 | 0.002           | 0.020           | No        | No         | No       | Yes        |
|             | Uranium   | 7440611  | mg/kg   | 0.020               | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622  | mg/kg   | 0.20                | 0.20       | U         | U               | 0.02            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666  | mg/kg   | 19.5                | 19.5       |           | J               | 0.08            | 0.50            | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492  | mg/kg   | 2.51                | 2.51       |           | J-              | 0.05            | 0.10            | Yes       | No         | No       | Yes        |
| Freeze Dry  | Solids    |          | percent | 21.9                | 21.9       |           |                 |                 |                 | No        | No         | No       | Yes        |
| LabCalc     | Moisture  |          | percent | 78.1                | 78.1       |           |                 |                 |                 | No        | No         | No       | Yes        |
| NOAA LIPID  | Lipid     | Lipid    | percent | 0.66                | 0.66       |           |                 |                 | 0.24            | No        | No         | No       | Yes        |

**C. SERVICE REQUEST K1807597**

**Teck American Incorporated**  
**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | HOMOGENIZATION BLANK-NORTHERN PIKE 8/03 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|-----------------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-021                            |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result                     | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.25                                    | 0.25       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.02                                    | 0.02       | U,x       | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 11                                      | 11         | U         | U               | 4               | 11              | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 8                                       | 8          | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 42                                      | 42         | U         | UJ              | 3               | 42              | Yes       | Yes        | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 1.1                                     | 1.1        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                                     | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 30                                      | 30         | J         | J               | 20              | 210             | Yes       | No         | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 42                                      | 42         | U         | U               | 6               | 42              | No        | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                                    | 0.50       | U         | U               | 0.09            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.11                                    | 0.11       |           |                 | 0.05            | 0.10            | No        | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.007                                   | 0.007      | J         | J               | 0.006           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.010                                   | 0.010      | J         | J               | 0.009           | 0.020           | Yes       | No         | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 0.8                                     | 0.8        | J         | J               | 0.5             | 2.0             | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                                     | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |

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**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         |       | Sample                                  |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|-------|-----------------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         |       | HOMOGENIZATION BLANK-NORTHERN PIKE 8/03 |            |           |                 |                 |                 |           |            |          |            |
|             |           |         |       | Lab ID                                  |            |           |                 |                 |                 |           |            |          |            |
|             |           |         |       | K1807597-022                            |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units | Original Lab Result                     | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L  | 0.45                                    | 0.45       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L  | 0.02                                    | 0.02       | U,x       | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L  | 11                                      | 11         | U         | U               | 4               | 11              | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | ug/L  | 7                                       | 7          | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L  | 42                                      | 42         | U         | UJ              | 3               | 42              | Yes       | Yes        | No       | Yes        |
|             | Magnesium | 7439954 | ug/L  | 5.3                                     | 5.3        | U         | UJ              | 0.3             | 5.3             | Yes       | Yes        | No       | Yes        |
|             | Potassium | 7440097 | ug/L  | 210                                     | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L  | 210                                     | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L  | 42                                      | 42         | U         | U               | 6               | 42              | No        | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L  | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L  | 0.50                                    | 0.50       | U         | U               | 0.09            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L  | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Beryllium | 7440417 | ug/L  | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L  | 0.020                                   | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L  | 0.05                                    | 0.05       | J         | J               | 0.03            | 0.20            | Yes       | No         | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L  | 0.020                                   | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L  | 0.39                                    | 0.39       |           |                 | 0.05            | 0.10            | No        | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L  | 0.013                                   | 0.013      | J         | J               | 0.006           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965 | ug/L  | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Nickel    | 7440020 | ug/L  | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L  | 0.020                                   | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L  | 0.020                                   | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Uranium   | 7440611 | ug/L  | 0.020                                   | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L  | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L  | 2.0                                     | 2.0        | U         | U               | 0.5             | 2.0             | No        | Yes        | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L  | 1.0                                     | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |

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**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | HOMOGENIZATION BLANK-NORTHERN PIKE 8/14 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|-----------------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-003                            |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result                     | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.28                                    | 0.28       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.02                                    | 0.02       | U         | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 11                                      | 11         | U         | U               | 4               | 11              | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 10                                      | 10         | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 6                                       | 6          | J         | J               | 3               | 21              | Yes       | No         | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 0.8                                     | 0.8        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                                     | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 210                                     | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 170                                     | 170        | U         | UJ              | 6               | 170             | Yes       | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                                    | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.024                                   | 0.024      | J         | J               | 0.020           | 0.050           | Yes       | No         | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.04                                    | 0.04       | J         | J               | 0.02            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.007           | 0.020           | No        | Yes        | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.03                                    | 0.03       | J         | J               | 0.006           | 0.20            | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 2.5                                     | 2.5        |           |                 | 0.08            | 2.0             | No        | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                                     | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |

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**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | HOMOGENIZATION BLANK-NORTHERN PIKE 8/14 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|-----------------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-004                            |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result                     | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.25                                    | 0.25       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.02                                    | 0.02       | U         | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 11                                      | 11         | U         | U               | 4               | 11              | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 9                                       | 9          | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 5                                       | 5          | J         | J               | 3               | 21              | Yes       | No         | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 0.5                                     | 0.5        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                                     | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 210                                     | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 170                                     | 170        | U         | UJ              | 6               | 170             | Yes       | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                                    | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.021                                   | 0.021      | J         | J               | 0.020           | 0.050           | Yes       | No         | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.03                                    | 0.03       | J         | J               | 0.03            | 0.20            | Yes       | No         | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.10                                    | 0.10       | U         | U               | 0.02            | 0.10            | No        | Yes        | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.007           | 0.020           | No        | Yes        | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.02                                    | 0.02       | J         | J               | 0.006           | 0.20            | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 4.6                                     | 4.6        |           |                 | 0.08            | 2.0             | No        | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                                     | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |

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**SDG: K1807597**

|             |           |         | Sample | HOMOGENIZATION BLANK-NORTHERN PIKE 8/14 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|-----------------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | KQ1812163-03DUP                         |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result                     | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
| EPA1632A    | As_inorg  | 7440382 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
| EPA6010C    | Aluminum  | 7429905 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Calcium   | 7440702 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Iron      | 7439896 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Magnesium | 7439954 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Potassium | 7440097 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Sodium    | 7440235 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Sulfur    | 7704349 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                                    | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.04                                    | 0.04       | J         | J               | 0.02            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.007           | 0.020           | No        | Yes        | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.07                                    | 0.07       | J#        | J               | 0.006           | 0.20            | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 4.8                                     | 4.8        |           |                 | 0.08            | 2.0             | No        | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |

**Teck American Incorporated**  
**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | HOMOGENIZATION BLANK-NORTHERN PIKE 8/15 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|-----------------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-006                            |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result                     | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.21                                    | 0.21       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.02                                    | 0.02       | U         | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 4                                       | 4          | J         | J               | 4               | 11              | Yes       | No         | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 14                                      | 14         | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 8                                       | 8          | J         | J               | 3               | 21              | Yes       | No         | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 0.8                                     | 0.8        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                                     | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 210                                     | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 170                                     | 170        | U         | UJ              | 6               | 170             | Yes       | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                                    | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.025                                   | 0.025      | J         | J               | 0.020           | 0.050           | Yes       | No         | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.04                                    | 0.04       | J         | J               | 0.02            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.011                                   | 0.011      | J         | J               | 0.007           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.02                                    | 0.02       | J         | J               | 0.006           | 0.20            | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.22                                    | 0.22       |           |                 | 0.04            | 0.20            | No        | No         | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 3.8                                     | 3.8        |           |                 | 0.08            | 2.0             | No        | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                                     | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |



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|             |           |         | Sample | HOMOGENIZATION BLANK-NORTHERN PIKE 8/15 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|-----------------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-007                            |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result                     | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.21                                    | 0.21       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.02                                    | 0.02       | U         | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 11                                      | 11         | U         | U               | 4               | 11              | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 14                                      | 14         | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 5                                       | 5          | J         | J               | 3               | 21              | Yes       | No         | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 0.9                                     | 0.9        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                                     | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 210                                     | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 170                                     | 170        | U         | UJ              | 6               | 170             | Yes       | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                                    | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.08                                    | 0.08       | J         | J               | 0.02            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.007           | 0.020           | No        | Yes        | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.03                                    | 0.03       | J         | J               | 0.006           | 0.20            | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.13                                    | 0.13       | J         | J               | 0.04            | 0.20            | Yes       | No         | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 3.3                                     | 3.3        |           |                 | 0.08            | 2.0             | No        | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                                     | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |

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|             |           |         | Sample | HOMOGENIZATION BLANK-NORTHERN PIKE 8/17 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|-----------------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-009                            |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result                     | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.11                                    | 0.11       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.02                                    | 0.02       | U         | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 11                                      | 11         | U         | U               | 4               | 11              | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 6                                       | 6          | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 7                                       | 7          | J         | J               | 3               | 21              | Yes       | No         | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 1.1                                     | 1.1        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                                     | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 210                                     | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 170                                     | 170        | U         | UJ              | 6               | 170             | Yes       | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                                    | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.11                                    | 0.11       |           |                 | 0.02            | 0.10            | No        | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.007           | 0.020           | No        | Yes        | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.07                                    | 0.07       | J         | J               | 0.006           | 0.20            | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 3.1                                     | 3.1        |           |                 | 0.08            | 2.0             | No        | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                                     | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |

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|             |           |         | Sample | HOMOGENIZATION BLANK-NORTHERN PIKE 8/17 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|-----------------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-010                            |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result                     | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.13                                    | 0.13       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.02                                    | 0.02       | U         | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 11                                      | 11         | U         | U               | 4               | 11              | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 6                                       | 6          | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 4                                       | 4          | J         | J               | 3               | 21              | Yes       | No         | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 0.6                                     | 0.6        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                                     | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 210                                     | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 170                                     | 170        | U         | UJ              | 6               | 170             | Yes       | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                                    | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.027                                   | 0.027      | J         | J               | 0.020           | 0.050           | Yes       | No         | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.34                                    | 0.34       |           |                 | 0.02            | 0.10            | No        | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.012                                   | 0.012      | J         | J               | 0.007           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.20                                    | 0.20       | U         | UJ              | 0.006           | 0.20            | Yes       | Yes        | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.021                                   | 0.021      |           |                 | 0.008           | 0.020           | No        | No         | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 1.9                                     | 1.9        | J         | J               | 0.08            | 2.0             | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                                     | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |

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|             |           |         | Sample | HOMOGENIZATION BLANK-NORTHERN PIKE 8/17 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|-----------------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | KQ1811638-03DUP                         |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result                     | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
| EPA1632A    | As_inorg  | 7440382 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
| EPA6010C    | Aluminum  | 7429905 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Calcium   | 7440702 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Iron      | 7439896 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Magnesium | 7439954 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Potassium | 7440097 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Sodium    | 7440235 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Sulfur    | 7704349 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                                    | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.12                                    | 0.12       |           |                 | 0.02            | 0.10            | No        | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.007           | 0.020           | No        | Yes        | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.02                                    | 0.02       | J#        | J               | 0.006           | 0.20            | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 3.4                                     | 3.4        |           |                 | 0.08            | 2.0             | No        | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |

**Teck American Incorporated**  
**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | HOMOGENIZATION BLANK-NORTHERN PIKE 8/17 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|-----------------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | KQ1811639-03DUP                         |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result                     | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
| EPA1632A    | As_inorg  | 7440382 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
| EPA6010C    | Aluminum  | 7429905 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Calcium   | 7440702 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Iron      | 7439896 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Magnesium | 7439954 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Potassium | 7440097 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Sodium    | 7440235 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Sulfur    | 7704349 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
| EPA6020A    | Antimony  | 7440360 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Arsenic   | 7440382 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Barium    | 7440393 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Beryllium | 7440417 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Cadmium   | 7440439 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Chromium  | 7440473 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Cobalt    | 7440484 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Copper    | 7440508 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Lead      | 7439921 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Manganese | 7439965 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Nickel    | 7440020 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Silver    | 7440224 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Thallium  | 7440280 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Uranium   | 7440611 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Vanadium  | 7440622 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
|             | Zinc      | 7440666 | ug/L   |                                         |            |           |                 |                 |                 |           |            |          |            |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                                     | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |

**Teck American Incorporated**  
**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | HOMOGENIZATION BLANK-NORTHERN PIKE 8/21 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|-----------------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-012                            |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result                     | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.08                                    | 0.08       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.02                                    | 0.02       | U         | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 9                                       | 9          | J         | J               | 4               | 11              | Yes       | No         | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 25                                      | 25         |           |                 | 0.9             | 21              | No        | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 21                                      | 21         | U         | U               | 3               | 21              | No        | Yes        | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 0.9                                     | 0.9        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                                     | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 210                                     | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 170                                     | 170        | U         | UJ              | 6               | 170             | Yes       | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                                    | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.022                                   | 0.022      | J         | J               | 0.020           | 0.050           | Yes       | No         | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.003                                   | 0.003      | J         | J               | 0.002           | 0.020           | Yes       | No         | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.05                                    | 0.05       | J         | J               | 0.02            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.011                                   | 0.011      | J         | J               | 0.007           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.20                                    | 0.20       | U         | UJ              | 0.006           | 0.20            | Yes       | Yes        | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 2.0                                     | 2.0        |           |                 | 0.08            | 2.0             | No        | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                                     | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |

**Teck American Incorporated**  
**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | HOMOGENIZATION BLANK-NORTHERN PIKE 8/21 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|-----------------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-013                            |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result                     | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.11                                    | 0.11       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.02                                    | 0.02       | U         | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 7                                       | 7          | J         | J               | 4               | 11              | Yes       | No         | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 23                                      | 23         |           |                 | 0.9             | 21              | No        | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 6                                       | 6          | J         | J               | 3               | 21              | Yes       | No         | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 1.1                                     | 1.1        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                                     | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 210                                     | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 170                                     | 170        | U         | UJ              | 6               | 170             | Yes       | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                                    | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.06                                    | 0.06       | J         | J               | 0.02            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.007           | 0.020           | No        | Yes        | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.20                                    | 0.20       | U         | UJ              | 0.006           | 0.20            | Yes       | Yes        | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 0.6                                     | 0.6        | J         | J               | 0.08            | 2.0             | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                                     | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |

**Teck American Incorporated**  
**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | HOMOGENIZATION BLANK-NORTHERN PIKE 8/22 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|-----------------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-015                            |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result                     | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.14                                    | 0.14       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.02                                    | 0.02       | U         | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 11                                      | 11         | U         | U               | 4               | 11              | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 4                                       | 4          | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 6                                       | 6          | J         | J               | 3               | 21              | Yes       | No         | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 0.3                                     | 0.3        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                                     | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 210                                     | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 170                                     | 170        | U         | UJ              | 6               | 170             | Yes       | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                                    | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.03                                    | 0.03       | J         | J               | 0.02            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.007           | 0.020           | No        | Yes        | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.20                                    | 0.20       | U         | UJ              | 0.006           | 0.20            | Yes       | Yes        | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 0.6                                     | 0.6        | J         | J               | 0.08            | 2.0             | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                                     | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |



**Teck American Incorporated**  
**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | HOMOGENIZATION BLANK-NORTHERN PIKE 8/22 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|-----------------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-016                            |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result                     | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.09                                    | 0.09       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.02                                    | 0.02       | U         | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 11                                      | 11         | U         | U               | 4               | 11              | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 8                                       | 8          | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 7                                       | 7          | J         | J               | 3               | 21              | Yes       | No         | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 0.7                                     | 0.7        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                                     | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 210                                     | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 170                                     | 170        | U         | UJ              | 6               | 170             | Yes       | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                                    | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.06                                    | 0.06       | J         | J               | 0.02            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.007           | 0.020           | No        | Yes        | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.20                                    | 0.20       | U         | UJ              | 0.006           | 0.20            | Yes       | Yes        | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 1.2                                     | 1.2        | J         | J               | 0.08            | 2.0             | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                                     | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |

**Teck American Incorporated**  
**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | HOMOGENIZATION BLANK-NORTHERN PIKE 8/24 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|-----------------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-018                            |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result                     | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.08                                    | 0.08       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.02                                    | 0.02       | U         | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 5                                       | 5          | J         | J               | 4               | 11              | Yes       | No         | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 14                                      | 14         | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 5                                       | 5          | J         | J               | 3               | 21              | Yes       | No         | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 0.6                                     | 0.6        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                                     | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 210                                     | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 170                                     | 170        | U         | UJ              | 6               | 170             | Yes       | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                                    | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.06                                    | 0.06       | J         | J               | 0.02            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.007           | 0.020           | No        | Yes        | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.20                                    | 0.20       | U         | UJ              | 0.006           | 0.20            | Yes       | Yes        | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 2.2                                     | 2.2        |           |                 | 0.08            | 2.0             | No        | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                                     | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |

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**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | HOMOGENIZATION BLANK-NORTHERN PIKE 8/24 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|-----------------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-019                            |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result                     | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.09                                    | 0.09       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.02                                    | 0.02       | U         | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 11                                      | 11         | U         | U               | 4               | 11              | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 11                                      | 11         | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 5                                       | 5          | J         | J               | 3               | 21              | Yes       | No         | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 0.6                                     | 0.6        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                                     | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 210                                     | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 170                                     | 170        | U         | UJ              | 6               | 170             | Yes       | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                                    | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.050                                   | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.13                                    | 0.13       |           |                 | 0.02            | 0.10            | No        | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.007                                   | 0.007      | J         | J               | 0.007           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.20                                    | 0.20       | U         | UJ              | 0.006           | 0.20            | Yes       | Yes        | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.004                                   | 0.004      | J         | J               | 0.002           | 0.020           | Yes       | No         | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                                   | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                                    | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 1.6                                     | 1.6        | J         | J               | 0.08            | 2.0             | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                                     | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |

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**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | RINSATE BLANK-NORTHERN PIKE 8/03 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|----------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-020                     |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result              | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.46                             | 0.46       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.011                            | 0.011      | J,x       | J               | 0.003           | 0.02            | Yes       | No         | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 11                               | 11         | U         | U               | 4               | 11              | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 7                                | 7          | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 42                               | 42         | U         | UJ              | 3               | 42              | Yes       | Yes        | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 0.9                              | 0.9        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                              | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 210                              | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 42                               | 42         | U         | U               | 6               | 42              | No        | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                            | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                             | 0.50       | U         | U               | 0.09            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.025                            | 0.025      | J         | J               | 0.020           | 0.050           | Yes       | No         | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.13                             | 0.13       |           |                 | 0.05            | 0.10            | No        | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.034                            | 0.034      |           |                 | 0.006           | 0.020           | No        | No         | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.16                             | 0.16       | J         | J               | 0.04            | 0.20            | Yes       | No         | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.021                            | 0.021      |           |                 | 0.009           | 0.020           | No        | No         | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 2.0                              | 2.0        | U         | U               | 0.5             | 2.0             | No        | Yes        | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                              | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |

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**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | RINSATE BLANK-NORTHERN PIKE 8/14 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|----------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-002                     |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result              | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.32                             | 0.32       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.02                             | 0.02       | U         | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 11                               | 11         | U         | U               | 4               | 11              | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 11                               | 11         | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 7                                | 7          | J         | J               | 3               | 21              | Yes       | No         | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 2.7                              | 2.7        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                              | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 40                               | 40         | J         | J               | 20              | 210             | Yes       | No         | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 10                               | 10         | J         | J               | 6               | 170             | Yes       | No         | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                            | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                             | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.032                            | 0.032      | J         | J               | 0.020           | 0.050           | Yes       | No         | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.10                             | 0.10       | U         | U               | 0.02            | 0.10            | No        | Yes        | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.008                            | 0.008      | J         | J               | 0.007           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.07                             | 0.07       | J         | J               | 0.006           | 0.20            | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 48.0                             | 48.0       |           |                 | 0.08            | 2.0             | No        | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                              | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |

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**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | RINSATE BLANK-NORTHERN PIKE 8/14 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|----------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | KQ1811403-03DUP                  |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result              | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
| EPA1632A    | As_inorg  | 7440382 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 11                               | 11         | U         | U               | 4               | 11              | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 10                               | 10         | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 8                                | 8          | J         | J               | 3               | 21              | Yes       | No         | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 2.6                              | 2.6        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                              | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 50                               | 50         | J#        | J               | 20              | 210             | Yes       | No         | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 10                               | 10         | J         | J               | 6               | 170             | Yes       | No         | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Arsenic   | 7440382 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Barium    | 7440393 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Beryllium | 7440417 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Cadmium   | 7440439 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Chromium  | 7440473 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Cobalt    | 7440484 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Copper    | 7440508 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Lead      | 7439921 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Manganese | 7439965 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Nickel    | 7440020 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Silver    | 7440224 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Thallium  | 7440280 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Uranium   | 7440611 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Vanadium  | 7440622 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Zinc      | 7440666 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
| EPA7742     | Selenium  | 7782492 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |

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**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | RINSATE BLANK-NORTHERN PIKE 8/15 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|----------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-005                     |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result              | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.25                             | 0.25       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.02                             | 0.02       | U         | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 11                               | 11         | U         | U               | 4               | 11              | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 9                                | 9          | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 9                                | 9          | J         | J               | 3               | 21              | Yes       | No         | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 0.7                              | 0.7        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                              | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 210                              | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 170                              | 170        | U         | UJ              | 6               | 170             | Yes       | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                            | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                             | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.050                            | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.22                             | 0.22       |           |                 | 0.02            | 0.10            | No        | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.008                            | 0.008      | J         | J               | 0.007           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.04                             | 0.04       | J         | J               | 0.006           | 0.20            | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 3.1                              | 3.1        |           |                 | 0.08            | 2.0             | No        | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                              | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |

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**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | RINSATE BLANK-NORTHERN PIKE 8/17 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|----------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-008                     |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result              | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.09                             | 0.09       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.02                             | 0.02       | U         | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 11                               | 11         | U         | U               | 4               | 11              | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 6                                | 6          | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 4                                | 4          | J         | J               | 3               | 21              | Yes       | No         | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 0.7                              | 0.7        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                              | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 210                              | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 170                              | 170        | U         | UJ              | 6               | 170             | Yes       | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                            | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                             | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.044                            | 0.044      | J         | J               | 0.020           | 0.050           | Yes       | No         | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.12                             | 0.12       |           |                 | 0.02            | 0.10            | No        | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.016                            | 0.016      | J         | J               | 0.007           | 0.020           | Yes       | No         | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.006           | 0.20            | No        | Yes        | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.004                            | 0.004      | J         | J               | 0.002           | 0.020           | Yes       | No         | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.021                            | 0.021      |           |                 | 0.008           | 0.020           | No        | No         | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 2.6                              | 2.6        |           |                 | 0.08            | 2.0             | No        | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                              | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |



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**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | RINSATE BLANK-NORTHERN PIKE 8/17 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|----------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | KQ1811637-03DUP                  |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result              | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
| EPA1632A    | As_inorg  | 7440382 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 11                               | 11         | U         | U               | 4               | 11              | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 4                                | 4          | J#        | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 6                                | 6          | J#        | J               | 3               | 21              | Yes       | No         | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 0.5                              | 0.5        | J#        | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                              | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 210                              | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 170                              | 170        | U         | UJ              | 6               | 170             | Yes       | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Arsenic   | 7440382 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Barium    | 7440393 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Beryllium | 7440417 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Cadmium   | 7440439 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Chromium  | 7440473 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Cobalt    | 7440484 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Copper    | 7440508 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Lead      | 7439921 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Manganese | 7439965 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Nickel    | 7440020 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Silver    | 7440224 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Thallium  | 7440280 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Uranium   | 7440611 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Vanadium  | 7440622 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
|             | Zinc      | 7440666 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |
| EPA7742     | Selenium  | 7782492 | ug/L   |                                  |            |           |                 |                 |                 |           |            |          |            |

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**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | RINSATE BLANK-NORTHERN PIKE 8/21 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|----------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-011                     |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result              | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.5                              | 0.5        | U         | U               | 0.06            | 0.5             | No        | Yes        | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.02                             | 0.02       | U         | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 11                               | 11         | U         | U               | 4               | 11              | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 7                                | 7          | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 8                                | 8          | J         | J               | 3               | 21              | Yes       | No         | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 0.6                              | 0.6        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                              | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 210                              | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 170                              | 170        | U         | UJ              | 6               | 170             | Yes       | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                            | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                             | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.050                            | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.002                            | 0.002      | J         | J               | 0.002           | 0.020           | Yes       | No         | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.03                             | 0.03       | J         | J               | 0.02            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.007           | 0.020           | No        | Yes        | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.20                             | 0.20       | U         | UJ              | 0.006           | 0.20            | Yes       | Yes        | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 1.5                              | 1.5        | J         | J               | 0.08            | 2.0             | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                              | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |

**Teck American Incorporated**  
**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | RINSATE BLANK-NORTHERN PIKE 8/22 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|----------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-014                     |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result              | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.09                             | 0.09       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.02                             | 0.02       | U         | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 11                               | 11         | U         | U               | 4               | 11              | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 4                                | 4          | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 21                               | 21         | U         | U               | 3               | 21              | No        | Yes        | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 0.4                              | 0.4        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                              | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 210                              | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 170                              | 170        | U         | UJ              | 6               | 170             | Yes       | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                            | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                             | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.050                            | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.05                             | 0.05       | J         | J               | 0.02            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.007           | 0.020           | No        | Yes        | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.07                             | 0.07       | J         | J               | 0.006           | 0.20            | Yes       | No         | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 1.1                              | 1.1        | J         | J               | 0.08            | 2.0             | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                              | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |

**Teck American Incorporated**  
**Upper Columbia River 2018 Northern Pike Tissue Study**  
**SDG: K1807597**

|             |           |         | Sample | RINSATE BLANK-NORTHERN PIKE 8/24 |            |           |                 |                 |                 |           |            |          |            |
|-------------|-----------|---------|--------|----------------------------------|------------|-----------|-----------------|-----------------|-----------------|-----------|------------|----------|------------|
|             |           |         | Lab ID | K1807597-017                     |            |           |                 |                 |                 |           |            |          |            |
| Method Code | Analyte   | Cas No  | Units  | Original Lab Result              | Meas Value | Lab Flags | Validator Flags | Detection Limit | Reporting Limit | Estimated | Undetected | Rejected | Reportable |
| EPA1631E    | Mercury   | 7439976 | ng/L   | 0.16                             | 0.16       | J         | J               | 0.06            | 0.5             | Yes       | No         | No       | Yes        |
| EPA1632A    | As_inorg  | 7440382 | ug/L   | 0.02                             | 0.02       | U         | U               | 0.003           | 0.02            | No        | Yes        | No       | Yes        |
| EPA6010C    | Aluminum  | 7429905 | ug/L   | 11                               | 11         | U         | U               | 4               | 11              | No        | Yes        | No       | Yes        |
|             | Calcium   | 7440702 | ug/L   | 9                                | 9          | J         | J               | 0.9             | 21              | Yes       | No         | No       | Yes        |
|             | Iron      | 7439896 | ug/L   | 9                                | 9          | J         | J               | 3               | 21              | Yes       | No         | No       | Yes        |
|             | Magnesium | 7439954 | ug/L   | 0.4                              | 0.4        | J         | J               | 0.3             | 5.3             | Yes       | No         | No       | Yes        |
|             | Potassium | 7440097 | ug/L   | 210                              | 210        | U         | U               | 60              | 210             | No        | Yes        | No       | Yes        |
|             | Sodium    | 7440235 | ug/L   | 210                              | 210        | U         | U               | 20              | 210             | No        | Yes        | No       | Yes        |
|             | Sulfur    | 7704349 | ug/L   | 170                              | 170        | U         | UJ              | 6               | 170             | Yes       | Yes        | No       | Yes        |
| EPA6020A    | Antimony  | 7440360 | ug/L   | 0.050                            | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Arsenic   | 7440382 | ug/L   | 0.50                             | 0.50       | U         | U               | 0.08            | 0.50            | No        | Yes        | No       | Yes        |
|             | Barium    | 7440393 | ug/L   | 0.050                            | 0.050      | U         | U               | 0.020           | 0.050           | No        | Yes        | No       | Yes        |
|             | Beryllium | 7440417 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Cadmium   | 7440439 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.009           | 0.020           | No        | Yes        | No       | Yes        |
|             | Chromium  | 7440473 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.03            | 0.20            | No        | Yes        | No       | Yes        |
|             | Cobalt    | 7440484 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Copper    | 7440508 | ug/L   | 0.04                             | 0.04       | J         | J               | 0.02            | 0.10            | Yes       | No         | No       | Yes        |
|             | Lead      | 7439921 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.007           | 0.020           | No        | Yes        | No       | Yes        |
|             | Manganese | 7439965 | ug/L   | 0.20                             | 0.20       | U         | UJ              | 0.006           | 0.20            | Yes       | Yes        | No       | Yes        |
|             | Nickel    | 7440020 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Silver    | 7440224 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.002           | 0.020           | No        | Yes        | No       | Yes        |
|             | Thallium  | 7440280 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.008           | 0.020           | No        | Yes        | No       | Yes        |
|             | Uranium   | 7440611 | ug/L   | 0.020                            | 0.020      | U         | U               | 0.005           | 0.020           | No        | Yes        | No       | Yes        |
|             | Vanadium  | 7440622 | ug/L   | 0.20                             | 0.20       | U         | U               | 0.04            | 0.20            | No        | Yes        | No       | Yes        |
|             | Zinc      | 7440666 | ug/L   | 1.5                              | 1.5        | J         | J               | 0.08            | 2.0             | Yes       | No         | No       | Yes        |
| EPA7742     | Selenium  | 7782492 | ug/L   | 1.0                              | 1.0        | U         | U               | 0.2             | 1.0             | No        | Yes        | No       | Yes        |

## **SECTION 3**

### **INORGANIC DATA SUPPORT DOCUMENTATION**

**A. SERVICE REQUEST K1807185**

## INORGANIC ANALYSIS SUPPORT DOCUMENTATION

ESI project name: Teck UCR Northern Pike  
 Sample Collection Dates: 7/25 & 7/26/18  
 Job Number: 20188280  
 Project Manager: Tom Weinmann  
 Laboratory: ALS

Reviewed by: THW  
 Approved by: AP  
 Completion Date: 10/2018

Applicable Sample No's ( x )

Refer to Table 1 in the Quality Assurance Review

|              |                                                                              |                               |                        |
|--------------|------------------------------------------------------------------------------|-------------------------------|------------------------|
| Deliverable: | CLP (Full)     ( )<br>Level IV (Full)     ( x )<br>Limited     ( )<br>Other: | <u>Sample No.</u><br>K1807185 | <u>Lab Control No.</u> |
|--------------|------------------------------------------------------------------------------|-------------------------------|------------------------|

The following table indicates criteria that were examined, the identified problems, and support documentation attachments

|                                         | Criteria Examined in Detail                            |      |       |       |  | Problems Identified                                    |      |       |       |  | Support Documentation Attachments                      |      |       |       |  |
|-----------------------------------------|--------------------------------------------------------|------|-------|-------|--|--------------------------------------------------------|------|-------|-------|--|--------------------------------------------------------|------|-------|-------|--|
|                                         | Check (✓) if Yes or Footnote Letter for Comments Below |      |       |       |  | Check (✓) if Yes or Footnote Letter for Comments Below |      |       |       |  | Check (✓) if Yes or Footnote Letter for Comments Below |      |       |       |  |
|                                         | 6010C/6020A                                            | 7742 | 1631E | 1632A |  | 6010C/6020A                                            | 7742 | 1631E | 1632A |  | 6010C/6020A                                            | 7742 | 1631E | 1632A |  |
| Holding Times                           | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Blank Analysis Results                  | x                                                      | x    | x     | x     |  | x                                                      |      |       |       |  | x                                                      | x    | x     | x     |  |
| Matrix Spike (Predigestion) Results     | x                                                      | x    | x     | x     |  |                                                        | x    |       | x     |  | x                                                      | x    | x     | x     |  |
| Duplicate Analysis: ( ) Field ( x ) Lab | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Quantitation of Results                 | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Detection Limit/Sensitivity             | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Initial Calibrations                    | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Continuing Calibrations                 | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Laboratory Control Standard (LCS)       | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| ICP Linear Range Analysis               | x                                                      |      |       |       |  |                                                        |      |       |       |  | x                                                      |      |       |       |  |
| ICP Interference Checks                 | x                                                      |      |       |       |  |                                                        |      |       |       |  | x                                                      |      |       |       |  |
| ICP Serial Dilutions                    | x                                                      |      |       |       |  | x                                                      |      |       |       |  | x                                                      |      |       |       |  |
| ICP Post-Digestion Spike                | x                                                      |      |       |       |  |                                                        |      |       |       |  | x                                                      |      |       |       |  |
| GFAA Post Digestion Spikes              |                                                        |      |       |       |  |                                                        |      |       |       |  |                                                        |      |       |       |  |
| GFAA Duplicate Injections               |                                                        |      |       |       |  |                                                        |      |       |       |  |                                                        |      |       |       |  |
| ICP Multiple Exposures                  |                                                        |      |       |       |  |                                                        |      |       |       |  |                                                        |      |       |       |  |
| GFAA Standard Additions                 |                                                        |      |       |       |  |                                                        |      |       |       |  |                                                        |      |       |       |  |
| CRDL Standards                          | x                                                      |      |       |       |  |                                                        |      |       |       |  | x                                                      |      |       |       |  |
| Condition on Receipt                    | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Percent Solids                          |                                                        |      |       |       |  |                                                        |      |       |       |  |                                                        |      |       |       |  |
| Others:                                 |                                                        |      |       |       |  |                                                        |      |       |       |  |                                                        |      |       |       |  |

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## BLANK ANALYSIS RESULTS FOR INORGANIC PARAMETERS

[illegible]

Aq = Aqueous; S = Solid

Notes:



ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807185

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID           | Analyte   | Method | Analysis Batch: | Result  | True Value | % Rec | % Rec. Limits |
|---------------------|-----------|--------|-----------------|---------|------------|-------|---------------|
| ICVB 08/30/18 14:42 | Aluminum  | 6010C  | 604833          | 985 ✓   | 1000       | 99 ✓  | 90-110 ✓      |
|                     | Calcium   | 6010C  | 604833          | 4860    | 5000       | 97    | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 4880    | 5000       | 98    | 90-110        |
|                     | Sulfur    | 6010C  | 604833          | 4810    | 5000       | 96    | 90-110        |
| ICV 08/30/18 14:44  | Aluminum  | 6010C  | 604833          | 4940    | 5000       | 99    | 90-110        |
|                     | Calcium   | 6010C  | 604833          | 12200   | 12500      | 98    | 90-110        |
|                     | Iron      | 6010C  | 604833          | 2530 ✓  | 2500       | 101 ✓ | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 12300   | 12500      | 99    | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 12500   | 12500      | 100   | 90-110        |
|                     | Potassium | 6010C  | 604833          | 12300   | 12500      | 98    | 90-110        |
|                     | Sodium    | 6010C  | 604833          | 12400   | 12500      | 99    | 90-110        |
| CCVB 08/30/18 14:54 | Aluminum  | 6010C  | 604833          | 10200   | 10000      | 102   | 90-110        |
|                     | Calcium   | 6010C  | 604833          | 9950    | 10000      | 99    | 90-110        |
|                     | Iron      | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 10200   | 10000      | 102   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 10000   | 10000      | 100   | 90-110        |
|                     | Potassium | 6010C  | 604833          | 9850 ✓  | 10000      | 99 ✓  | 90-110        |
|                     | Sodium    | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Sulfur    | 6010C  | 604833          | 987     | 1000       | 99    | 90-110        |
| CCVA 08/30/18 14:56 | Aluminum  | 6010C  | 604833          | 251     | 250        | 100   | 90-110        |
|                     | Calcium   | 6010C  | 604833          | 502     | 500        | 100   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 252 ✓   | 250        | 101 ✓ | 90-110        |
| CCVB 08/30/18 16:15 | Aluminum  | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Calcium   | 6010C  | 604833          | 10100 ✓ | 10000      | 101 ✓ | 90-110        |
|                     | Iron      | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Potassium | 6010C  | 604833          | 10200   | 10000      | 102   | 90-110        |
|                     | Sodium    | 6010C  | 604833          | 10000   | 10000      | 100   | 90-110        |
|                     | Sulfur    | 6010C  | 604833          | 1000    | 1000       | 100   | 90-110        |
| CCVA 08/30/18 16:19 | Aluminum  | 6010C  | 604833          | 261 ✓   | 250        | 104 ✓ | 90-110        |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807185

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID           | Analyte   | Method | Analysis Batch: | Result  | True Value | % Rec | % Rec. Limits |
|---------------------|-----------|--------|-----------------|---------|------------|-------|---------------|
| CCVA 08/30/18 16:19 | Calcium   | 6010C  | 604833          | 509     | 500        | 102   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 253     | 250        | 101   | 90-110        |
| CCVB 08/30/18 16:48 | Aluminum  | 6010C  | 604833          | 10300   | 10000      | 103   | 90-110        |
|                     | Calcium   | 6010C  | 604833          | 10200   | 10000      | 102   | 90-110        |
|                     | Iron      | 6010C  | 604833          | 10300   | 10000      | 103   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 10300   | 10000      | 103   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Potassium | 6010C  | 604833          | 10300 ✓ | 10000      | 103 ✓ | 90-110        |
|                     | Sodium    | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Sulfur    | 6010C  | 604833          | 1020    | 1000       | 102   | 90-110        |
| CCVA 08/30/18 16:51 | Aluminum  | 6010C  | 604833          | 260     | 250        | 104   | 90-110        |
|                     | Calcium   | 6010C  | 604833          | 512 ✓   | 500        | 102 ✓ | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 267     | 250        | 107   | 90-110        |
| CCVB 08/30/18 17:01 | Aluminum  | 6010C  | 604833          | 10400   | 10000      | 104   | 90-110        |
|                     | Calcium   | 6010C  | 604833          | 9970    | 10000      | 100   | 90-110        |
|                     | Iron      | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 10200   | 10000      | 102   | 90-110        |
|                     | Potassium | 6010C  | 604833          | 10400   | 10000      | 104   | 90-110        |
|                     | Sodium    | 6010C  | 604833          | 10200   | 10000      | 102   | 90-110        |
|                     | Sulfur    | 6010C  | 604833          | 1030    | 1000       | 103   | 90-110        |
| CCVA 08/30/18 17:04 | Aluminum  | 6010C  | 604833          | 262     | 250        | 105   | 90-110        |
|                     | Calcium   | 6010C  | 604833          | 499     | 500        | 100   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 251     | 250        | 100   | 90-110        |
| ICV 08/30/18 17:25  | Antimony  | 6020A  | 604807          | 12.4    | 12.5       | 100   | 90-110        |
|                     | Arsenic   | 6020A  | 604807          | 25.0 ✓  | 25.0       | 100 ✓ | 90-110        |
|                     | Barium    | 6020A  | 604807          | 98.5    | 100        | 98    | 90-110        |
|                     | Beryllium | 6020A  | 604807          | 2.52    | 2.50       | 101   | 90-110        |
|                     | Cadmium   | 6020A  | 604807          | 12.5    | 12.5       | 100   | 90-110        |
|                     | Chromium  | 6020A  | 604807          | 9.91    | 10.0       | 99    | 90-110        |
|                     | Cobalt    | 6020A  | 604807          | 24.9    | 25.0       | 99    | 90-110        |

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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807185

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec. Limits |
|--------------------|-----------|--------|-----------------|--------|------------|-------|---------------|
| ICV 08/30/18 17:25 | Copper    | 6020A  | 604807          | 12.5   | 12.5       | 100   | 90-110        |
|                    | Lead      | 6020A  | 604807          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Manganese | 6020A  | 604807          | 24.9   | 25.0       | 100   | 90-110        |
|                    | Nickel    | 6020A  | 604807          | 24.5 ✓ | 25.0       | 98 ✓  | 90-110        |
|                    | Silver    | 6020A  | 604807          | 12.6   | 12.5       | 101   | 90-110        |
|                    | Thallium  | 6020A  | 604807          | 25.1   | 25.0       | 100   | 90-110        |
|                    | Uranium   | 6020A  | 604807          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Vanadium  | 6020A  | 604807          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Zinc      | 6020A  | 604807          | 23.8   | 25.0       | 95    | 90-110        |
| CCV 08/30/18 17:29 | Antimony  | 6020A  | 604807          | 13.2   | 12.5       | 106   | 90-110        |
|                    | Arsenic   | 6020A  | 604807          | 26.5   | 25.0       | 106   | 90-110        |
|                    | Barium    | 6020A  | 604807          | 26.9   | 25.0       | 107   | 90-110        |
|                    | Beryllium | 6020A  | 604807          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Cadmium   | 6020A  | 604807          | 26.7 ✓ | 25.0       | 107 ✓ | 90-110        |
|                    | Chromium  | 6020A  | 604807          | 26.7   | 25.0       | 107   | 90-110        |
|                    | Cobalt    | 6020A  | 604807          | 26.7   | 25.0       | 107   | 90-110        |
|                    | Copper    | 6020A  | 604807          | 26.6   | 25.0       | 107   | 90-110        |
|                    | Lead      | 6020A  | 604807          | 26.3   | 25.0       | 105   | 90-110        |
|                    | Manganese | 6020A  | 604807          | 26.7   | 25.0       | 107   | 90-110        |
|                    | Nickel    | 6020A  | 604807          | 26.8   | 25.0       | 107   | 90-110        |
|                    | Silver    | 6020A  | 604807          | 13.2   | 12.5       | 106   | 90-110        |
|                    | Thallium  | 6020A  | 604807          | 26.4 ✓ | 25.0       | 106 ✓ | 90-110        |
|                    | Uranium   | 6020A  | 604807          | 26.4   | 25.0       | 106   | 90-110        |
|                    | Vanadium  | 6020A  | 604807          | 26.7   | 25.0       | 107   | 90-110        |
|                    | Zinc      | 6020A  | 604807          | 27.1   | 25.0       | 109   | 90-110        |
| CCV 08/30/18 18:19 | Antimony  | 6020A  | 604807          | 12.7   | 12.5       | 102   | 90-110        |
|                    | Arsenic   | 6020A  | 604807          | 25.1   | 25.0       | 100   | 90-110        |
|                    | Barium    | 6020A  | 604807          | 25.1   | 25.0       | 101   | 90-110        |
|                    | Beryllium | 6020A  | 604807          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Cadmium   | 6020A  | 604807          | 25.4   | 25.0       | 102   | 90-110        |
|                    | Chromium  | 6020A  | 604807          | 25.3   | 25.0       | 101   | 90-110        |
|                    | Cobalt    | 6020A  | 604807          | 25.4 ✓ | 25.0       | 102 ✓ | 90-110        |
|                    | Copper    | 6020A  | 604807          | 25.4   | 25.0       | 102   | 90-110        |
|                    | Lead      | 6020A  | 604807          | 25.4   | 25.0       | 102   | 90-110        |

ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807185

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec. Limits |
|--------------------|-----------|--------|-----------------|--------|------------|-------|---------------|
| CCV 08/30/18 18:19 | Manganese | 6020A  | 604807          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Nickel    | 6020A  | 604807          | 25.5   | 25.0       | 102   | 90-110        |
|                    | Silver    | 6020A  | 604807          | 12.6   | 12.5       | 101   | 90-110        |
|                    | Thallium  | 6020A  | 604807          | 25.6   | 25.0       | 102   | 90-110        |
|                    | Uranium   | 6020A  | 604807          | 25.5   | 25.0       | 102   | 90-110        |
|                    | Vanadium  | 6020A  | 604807          | 25.5   | 25.0       | 102   | 90-110        |
|                    | Zinc      | 6020A  | 604807          | 25.6 ✓ | 25.0       | 102 ✓ | 90-110        |
| CCV 08/30/18 18:56 | Antimony  | 6020A  | 604807          | 12.4   | 12.5       | 99    | 90-110        |
|                    | Arsenic   | 6020A  | 604807          | 24.9   | 25.0       | 100   | 90-110        |
|                    | Barium    | 6020A  | 604807          | 24.4   | 25.0       | 97    | 90-110        |
|                    | Beryllium | 6020A  | 604807          | 24.4 ✓ | 25.0       | 98 ✓  | 90-110        |
|                    | Cadmium   | 6020A  | 604807          | 25.1   | 25.0       | 101   | 90-110        |
|                    | Chromium  | 6020A  | 604807          | 25.3   | 25.0       | 101   | 90-110        |
|                    | Cobalt    | 6020A  | 604807          | 25.1   | 25.0       | 101   | 90-110        |
|                    | Copper    | 6020A  | 604807          | 24.9   | 25.0       | 100   | 90-110        |
|                    | Lead      | 6020A  | 604807          | 24.9   | 25.0       | 99    | 90-110        |
|                    | Manganese | 6020A  | 604807          | 24.8 ✓ | 25.0       | 99 ✓  | 90-110        |
|                    | Nickel    | 6020A  | 604807          | 25.1   | 25.0       | 100   | 90-110        |
|                    | Silver    | 6020A  | 604807          | 12.7   | 12.5       | 101   | 90-110        |
|                    | Thallium  | 6020A  | 604807          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Uranium   | 6020A  | 604807          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Vanadium  | 6020A  | 604807          | 25.3   | 25.0       | 101   | 90-110        |
|                    | Zinc      | 6020A  | 604807          | 25.0   | 25.0       | 100   | 90-110        |
| CCV 08/30/18 19:12 | Antimony  | 6020A  | 604807          | 12.4   | 12.5       | 100   | 90-110        |
|                    | Arsenic   | 6020A  | 604807          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Barium    | 6020A  | 604807          | 24.6   | 25.0       | 98    | 90-110        |
|                    | Beryllium | 6020A  | 604807          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Cadmium   | 6020A  | 604807          | 25.5   | 25.0       | 102   | 90-110        |
|                    | Chromium  | 6020A  | 604807          | 26.0   | 25.0       | 104   | 90-110        |
|                    | Cobalt    | 6020A  | 604807          | 25.6   | 25.0       | 102   | 90-110        |
|                    | Copper    | 6020A  | 604807          | 25.5   | 25.0       | 102   | 90-110        |
|                    | Lead      | 6020A  | 604807          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Manganese | 6020A  | 604807          | 25.5   | 25.0       | 102   | 90-110        |
|                    | Nickel    | 6020A  | 604807          | 25.6   | 25.0       | 102   | 90-110        |

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807185

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID          | Analyte  | Method | Analysis Batch: | Result | True Value | % Rec | % Rec. Limits |
|--------------------|----------|--------|-----------------|--------|------------|-------|---------------|
| CCV 08/30/18 19:12 | Silver   | 6020A  | 604807          | 12.8   | 12.5       | 103   | 90-110        |
|                    | Thallium | 6020A  | 604807          | 25.1   | 25.0       | 100   | 90-110        |
|                    | Uranium  | 6020A  | 604807          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Vanadium | 6020A  | 604807          | 25.9   | 25.0       | 103   | 90-110        |
|                    | Zinc     | 6020A  | 604807          | 25.7   | 25.0       | 103   | 90-110        |
| ICV 08/31/18 11:21 | Selenium | 7742   | 605054          | 4.13 ✓ | 4.00       | 103 ✓ | 90-110        |
| CCV 08/31/18 11:27 | Selenium | 7742   | 605054          | 4.22 ✓ | 4.00       | 106 ✓ | 90-110        |
| CCV 08/31/18 11:55 | Selenium | 7742   | 605054          | 4.20 ✓ | 4.00       | 105 ✓ | 90-110        |
| CCV 08/31/18 12:23 | Selenium | 7742   | 605054          | 4.14 ✓ | 4.00       | 104 ✓ | 90-110        |
| CCV 08/31/18 12:51 | Selenium | 7742   | 605054          | 3.97 ✓ | 4.00       | 99 ✓  | 90-110        |
| CCV 08/31/18 13:36 | Selenium | 7742   | 605054          | 4.04 ✓ | 4.00       | 101 ✓ | 90-110        |
| CCV 08/31/18 14:01 | Selenium | 7742   | 605054          | 4.04 ✓ | 4.00       | 101 ✓ | 90-110        |

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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807185

LOW LEVEL INITIAL AND LOW LEVEL CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID | Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec. Limits | Analysis Date  |
|-----------|-----------|--------|-----------------|--------|------------|-------|---------------|----------------|
| LLICV     | Aluminum  | 6010C  | 604833          | 10.3   | 10.0       | 103   | 70-130        | 08/30/18 14:49 |
|           | Calcium   | 6010C  | 604833          | 20.2 ✓ | 20.0       | 101 ✓ | 70-130        | 08/30/18 14:49 |
|           | Magnesium | 6010C  | 604833          | 4.8    | 5.0        | 96    | 70-130        | 08/30/18 14:49 |
|           | Potassium | 6010C  | 604833          | 205    | 200        | 103   | 70-130        | 08/30/18 14:49 |
|           | Sodium    | 6010C  | 604833          | 172    | 200        | 86    | 70-130        | 08/30/18 14:49 |
| LLICV     | Iron      | 6010C  | 604833          | 49.7   | 40.0       | 124   | 70-130        | 08/30/18 14:51 |
|           | Sulfur    | 6010C  | 604833          | 80.0 ✓ | 80.0       | 100 ✓ | 70-130        | 08/30/18 14:51 |
| LLCCV     | Aluminum  | 6010C  | 604833          | 9.7    | 10.0       | 97    | 70-130        | 08/30/18 17:09 |
|           | Calcium   | 6010C  | 604833          | 20.6   | 20.0       | 103   | 70-130        | 08/30/18 17:09 |
|           | Magnesium | 6010C  | 604833          | 4.8 ✓  | 5.0        | 96 ✓  | 70-130        | 08/30/18 17:09 |
|           | Sodium    | 6010C  | 604833          | 183    | 200        | 92    | 70-130        | 08/30/18 17:09 |
| LLCCV     | Potassium | 6010C  | 604833          | 432 ✓  | 400        | 108 ✓ | 70-130        | 08/30/18 17:14 |
|           | Sulfur    | 6010C  | 604833          | 83.3   | 80.0       | 104   | 70-130        | 08/30/18 17:14 |
| LLCCV     | Iron      | 6010C  | 604833          | 63.4 ✓ | 80.0       | 79 ✓  | 70-130        | 08/30/18 17:20 |
| LLICVT    | Antimony  | 6020A  | 604807          | 0.11   | 0.1        | 109   | 70-130        | 08/30/18 17:38 |
|           | Arsenic   | 6020A  | 604807          | 0.94   | 1.0        | 94    | 70-130        | 08/30/18 17:38 |
|           | Barium    | 6020A  | 604807          | 0.10   | 0.1        | 105   | 70-130        | 08/30/18 17:38 |
|           | Beryllium | 6020A  | 604807          | 0.042  | 0.04       | 105   | 70-130        | 08/30/18 17:38 |
|           | Cadmium   | 6020A  | 604807          | 0.043  | 0.04       | 107   | 70-130        | 08/30/18 17:38 |
|           | Chromium  | 6020A  | 604807          | 0.39 ✓ | 0.4        | 98 ✓  | 70-130        | 08/30/18 17:38 |
|           | Cobalt    | 6020A  | 604807          | 0.038  | 0.04       | 96    | 70-130        | 08/30/18 17:38 |
|           | Copper    | 6020A  | 604807          | 0.20   | 0.2        | 102   | 70-130        | 08/30/18 17:38 |
|           | Lead      | 6020A  | 604807          | 0.044  | 0.04       | 110   | 70-130        | 08/30/18 17:38 |
|           | Manganese | 6020A  | 604807          | 0.11   | 0.1        | 111   | 70-130        | 08/30/18 17:38 |
|           | Nickel    | 6020A  | 604807          | 0.42   | 0.4        | 104   | 70-130        | 08/30/18 17:38 |
|           | Silver    | 6020A  | 604807          | 0.038  | 0.04       | 96    | 70-130        | 08/30/18 17:38 |
|           | Thallium  | 6020A  | 604807          | 0.047  | 0.04       | 117   | 70-130        | 08/30/18 17:38 |
|           | Uranium   | 6020A  | 604807          | 0.038  | 0.04       | 96    | 70-130        | 08/30/18 17:38 |
|           | Vanadium  | 6020A  | 604807          | 0.42 ✓ | 0.4        | 104 ✓ | 70-130        | 08/30/18 17:38 |
|           | Zinc      | 6020A  | 604807          | 0.97   | 1.0        | 97    | 70-130        | 08/30/18 17:38 |

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807185

**LOW LEVEL INITIAL AND LOW LEVEL CONTINUING CALIBRATION VERIFICATION**

Concentration Units: ug/L

| Sample ID | Analyte   | Method | Analysis Batch: | Result  | True Value | ✓<br>% Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|-----------|--------|-----------------|---------|------------|------------|------------------|----------------|
| LLCCVT    |           |        |                 |         |            |            |                  |                |
|           | Antimony  | 6020A  | 604807          | 0.11    | 0.1        | 114        | 70-130           | 08/30/18 19:18 |
|           | Arsenic   | 6020A  | 604807          | 1.0     | 1.0        | 102        | 70-130           | 08/30/18 19:18 |
|           | Barium    | 6020A  | 604807          | 0.11    | 0.1        | 106        | 70-130           | 08/30/18 19:18 |
|           | Beryllium | 6020A  | 604807          | 0.038   | 0.04       | 95         | 70-130           | 08/30/18 19:18 |
|           | Cadmium   | 6020A  | 604807          | 0.048   | 0.04       | 119        | 70-130           | 08/30/18 19:18 |
|           | Chromium  | 6020A  | 604807          | 0.42 ✓  | 0.4        | 104 ✓      | 70-130           | 08/30/18 19:18 |
|           | Cobalt    | 6020A  | 604807          | 0.040   | 0.04       | 101        | 70-130           | 08/30/18 19:18 |
|           | Copper    | 6020A  | 604807          | 0.20    | 0.2        | 98         | 70-130           | 08/30/18 19:18 |
|           | Lead      | 6020A  | 604807          | 0.042   | 0.04       | 104        | 70-130           | 08/30/18 19:18 |
|           | Manganese | 6020A  | 604807          | 0.11    | 0.1        | 109        | 70-130           | 08/30/18 19:18 |
|           | Nickel    | 6020A  | 604807          | 0.41    | 0.4        | 103        | 70-130           | 08/30/18 19:18 |
|           | Silver    | 6020A  | 604807          | 0.038 ✓ | 0.04       | 96 ✓       | 70-130           | 08/30/18 19:18 |
|           | Thallium  | 6020A  | 604807          | 0.045   | 0.04       | 112        | 70-130           | 08/30/18 19:18 |
|           | Uranium   | 6020A  | 604807          | 0.039   | 0.04       | 97         | 70-130           | 08/30/18 19:18 |
|           | Vanadium  | 6020A  | 604807          | 0.40    | 0.4        | 99         | 70-130           | 08/30/18 19:18 |
|           | Zinc      | 6020A  | 604807          | 1.1     | 1.0        | 105        | 70-130           | 08/30/18 19:18 |
| LLICV     |           |        |                 |         |            |            |                  |                |
|           | Selenium  | 7742   | 605054          | 0.19 ✓  | 0.2        | 94 ✓       | 70-130           | 08/31/18 11:25 |

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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807185

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | C |
|--------------------|-----------|--------|-----------------|--------|---|
| ICB 08/30/18 14:46 |           |        |                 |        |   |
|                    | Aluminum  | 6010C  | 604833          | 3      | U |
|                    | Calcium   | 6010C  | 604833          | 20     | U |
|                    | Iron      | 6010C  | 604833          | 20     | J |
|                    | Magnesium | 6010C  | 604833          | 6      | U |
|                    | Potassium | 6010C  | 604833          | 90     | U |
|                    | Sodium    | 6010C  | 604833          | 20     | U |
|                    | Sulfur    | 6010C  | 604833          | 10     | U |
| CCB 08/30/18 15:29 |           |        |                 |        |   |
|                    | Aluminum  | 6010C  | 604833          | 3      | U |
|                    | Calcium   | 6010C  | 604833          | 20     | U |
|                    | Iron      | 6010C  | 604833          | 30     | J |
|                    | Magnesium | 6010C  | 604833          | 6      | U |
|                    | Potassium | 6010C  | 604833          | 90     | U |
|                    | Sodium    | 6010C  | 604833          | -28.2  | J |
|                    | Sulfur    | 6010C  | 604833          | 10     | U |
| CCB 08/30/18 16:22 |           |        |                 |        |   |
|                    | Aluminum  | 6010C  | 604833          | 3      | U |
|                    | Calcium   | 6010C  | 604833          | 20     | U |
|                    | Iron      | 6010C  | 604833          | 20     | J |
|                    | Magnesium | 6010C  | 604833          | 6      | U |
|                    | Potassium | 6010C  | 604833          | 90     | U |
|                    | Sodium    | 6010C  | 604833          | 20     | U |
|                    | Sulfur    | 6010C  | 604833          | 10     | U |
| CCB 08/30/18 16:54 |           |        |                 |        |   |
|                    | Aluminum  | 6010C  | 604833          | 3      | U |
|                    | Calcium   | 6010C  | 604833          | 20     | U |
|                    | Iron      | 6010C  | 604833          | 10     | U |
|                    | Magnesium | 6010C  | 604833          | 6      | U |
|                    | Potassium | 6010C  | 604833          | 160    | J |
|                    | Sodium    | 6010C  | 604833          | 20     | U |
|                    | Sulfur    | 6010C  | 604833          | 10     | U |
| CCB 08/30/18 17:06 |           |        |                 |        |   |
|                    | Aluminum  | 6010C  | 604833          | 3      | U |
|                    | Calcium   | 6010C  | 604833          | 20     | U |
|                    | Iron      | 6010C  | 604833          | 21     | J |
|                    | Magnesium | 6010C  | 604833          | 6      | U |

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no impact



ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807185

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | C |
|--------------------|-----------|--------|-----------------|--------|---|
| CCB 08/30/18 17:06 | Potassium | 6010C  | 604833          | 90     | U |
|                    | Sodium    | 6010C  | 604833          | 20     | U |
|                    | Sulfur    | 6010C  | 604833          | 10     | U |
| ICB 08/30/18 17:32 | Antimony  | 6020A  | 604807          | 0.01   | U |
|                    | Arsenic   | 6020A  | 604807          | 0.04   | U |
|                    | Barium    | 6020A  | 604807          | 0.04   | U |
|                    | Beryllium | 6020A  | 604807          | 0.016  | U |
|                    | Cadmium   | 6020A  | 604807          | 0.006  | U |
|                    | Chromium  | 6020A  | 604807          | 0.04   | U |
|                    | Cobalt    | 6020A  | 604807          | 0.006  | U |
|                    | Copper    | 6020A  | 604807          | 0.06   | U |
|                    | Lead      | 6020A  | 604807          | 0.006  | U |
|                    | Manganese | 6020A  | 604807          | 0.02   | U |
|                    | Nickel    | 6020A  | 604807          | 0.04   | U |
|                    | Silver    | 6020A  | 604807          | 0.004  | U |
|                    | Thallium  | 6020A  | 604807          | 0.004  | U |
|                    | Uranium   | 6020A  | 604807          | 0.004  | U |
|                    | Vanadium  | 6020A  | 604807          | 0.04   | U |
|                    | Zinc      | 6020A  | 604807          | 0.2    | U |
| CCB 08/30/18 17:35 | Antimony  | 6020A  | 604807          | 0.01   | U |
|                    | Arsenic   | 6020A  | 604807          | 0.04   | U |
|                    | Barium    | 6020A  | 604807          | 0.04   | U |
|                    | Beryllium | 6020A  | 604807          | 0.016  | U |
|                    | Cadmium   | 6020A  | 604807          | 0.006  | U |
|                    | Chromium  | 6020A  | 604807          | 0.04   | U |
|                    | Cobalt    | 6020A  | 604807          | 0.006  | U |
|                    | Copper    | 6020A  | 604807          | 0.06   | U |
|                    | Lead      | 6020A  | 604807          | 0.006  | U |
|                    | Manganese | 6020A  | 604807          | 0.02   | U |
|                    | Nickel    | 6020A  | 604807          | 0.04   | U |
|                    | Silver    | 6020A  | 604807          | 0.004  | U |
|                    | Thallium  | 6020A  | 604807          | 0.004  | U |
|                    | Uranium   | 6020A  | 604807          | 0.004  | U |
|                    | Vanadium  | 6020A  | 604807          | 0.04   | U |

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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807185

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | C |
|--------------------|-----------|--------|-----------------|--------|---|
| CCB 08/30/18 17:35 | Zinc      | 6020A  | 604807          | 0.2    | U |
| CCB 08/30/18 18:22 | Antimony  | 6020A  | 604807          | 0.01   | U |
|                    | Arsenic   | 6020A  | 604807          | 0.04   | U |
|                    | Barium    | 6020A  | 604807          | 0.04   | U |
|                    | Beryllium | 6020A  | 604807          | 0.016  | U |
|                    | Cadmium   | 6020A  | 604807          | 0.006  | U |
|                    | Chromium  | 6020A  | 604807          | 0.04   | U |
|                    | Cobalt    | 6020A  | 604807          | 0.006  | U |
|                    | Copper    | 6020A  | 604807          | 0.06   | U |
|                    | Lead      | 6020A  | 604807          | 0.006  | J |
|                    | Manganese | 6020A  | 604807          | 0.02   | U |
|                    | Nickel    | 6020A  | 604807          | 0.04   | U |
|                    | Silver    | 6020A  | 604807          | 0.004  | U |
|                    | Thallium  | 6020A  | 604807          | 0.004  | U |
|                    | Uranium   | 6020A  | 604807          | 0.004  | U |
|                    | Vanadium  | 6020A  | 604807          | 0.04   | U |
|                    | Zinc      | 6020A  | 604807          | 0.2    | U |
| CCB 08/30/18 18:59 | Antimony  | 6020A  | 604807          | 0.01   | U |
|                    | Arsenic   | 6020A  | 604807          | 0.04   | U |
|                    | Barium    | 6020A  | 604807          | 0.04   | U |
|                    | Beryllium | 6020A  | 604807          | 0.016  | U |
|                    | Cadmium   | 6020A  | 604807          | 0.006  | U |
|                    | Chromium  | 6020A  | 604807          | 0.04   | U |
|                    | Cobalt    | 6020A  | 604807          | 0.006  | U |
|                    | Copper    | 6020A  | 604807          | 0.06   | U |
|                    | Lead      | 6020A  | 604807          | 0.006  | U |
|                    | Manganese | 6020A  | 604807          | 0.02   | U |
|                    | Nickel    | 6020A  | 604807          | 0.04   | U |
|                    | Silver    | 6020A  | 604807          | 0.004  | U |
|                    | Thallium  | 6020A  | 604807          | 0.004  | U |
|                    | Uranium   | 6020A  | 604807          | 0.004  | U |
|                    | Vanadium  | 6020A  | 604807          | 0.04   | U |
|                    | Zinc      | 6020A  | 604807          | 0.2    | U |

no impact

ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807185

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | C |
|--------------------|-----------|--------|-----------------|--------|---|
| CCB 08/30/18 19:15 | Antimony  | 6020A  | 604807          | 0.01   | U |
|                    | Arsenic   | 6020A  | 604807          | 0.04   | U |
|                    | Barium    | 6020A  | 604807          | 0.04   | U |
|                    | Beryllium | 6020A  | 604807          | 0.016  | U |
|                    | Cadmium   | 6020A  | 604807          | 0.006  | U |
|                    | Chromium  | 6020A  | 604807          | 0.04   | U |
|                    | Cobalt    | 6020A  | 604807          | 0.006  | U |
|                    | Copper    | 6020A  | 604807          | 0.06   | U |
|                    | Lead      | 6020A  | 604807          | 0.006  | U |
|                    | Manganese | 6020A  | 604807          | 0.02   | U |
|                    | Nickel    | 6020A  | 604807          | 0.04   | U |
|                    | Silver    | 6020A  | 604807          | 0.004  | U |
|                    | Thallium  | 6020A  | 604807          | 0.004  | U |
|                    | Uranium   | 6020A  | 604807          | 0.004  | U |
|                    | Vanadium  | 6020A  | 604807          | 0.04   | U |
|                    | Zinc      | 6020A  | 604807          | 0.2    | U |
| ICB 08/31/18 11:23 | Selenium  | 7742   | 605054          | 0.20   | U |
| CCB 08/31/18 11:30 | Selenium  | 7742   | 605054          | 0.20   | U |
| CCB 08/31/18 11:58 | Selenium  | 7742   | 605054          | 0.20   | U |
| CCB 08/31/18 12:26 | Selenium  | 7742   | 605054          | 0.20   | U |
| CCB 08/31/18 12:53 | Selenium  | 7742   | 605054          | 0.20   | U |
| CCB 08/31/18 13:38 | Selenium  | 7742   | 605054          | 0.20   | U |
| CCB 08/31/18 14:03 | Selenium  | 7742   | 605054          | 0.20   | U |

ALS Group USA, Corp.  
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Analytical Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A  
Sample Matrix: Fish Tissue  
Sample Name: Method Blank  
Lab Code: KQ1811997-01 ✓

Service Request: K1807185

Date Collected: NA

Date Received: NA

Basis: Dry

Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL   | MDL   | Dil. | Date Analyzed  | Date Extracted | Q |
|--------------|-----------------|--------|-------|-------|-------|------|----------------|----------------|---|
| Aluminum     | 6010C           | ND U   | mg/Kg | 1     | 0.3   | 1    | 08/30/18 15:51 | 08/29/18       |   |
| Antimony     | 6020A           | ND U   | mg/Kg | 0.05  | 0.005 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Arsenic      | 6020A           | ND U   | mg/Kg | 0.5   | 0.02  | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Barium       | 6020A           | ND U   | mg/Kg | 0.05  | 0.020 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Beryllium    | 6020A           | ND U   | mg/Kg | 0.020 | 0.008 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Cadmium      | 6020A           | ND U   | mg/Kg | 0.020 | 0.003 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Calcium      | 6010C           | ND U   | mg/Kg | 4     | 2.0   | 1    | 08/30/18 15:51 | 08/29/18       |   |
| Chromium     | 6020A           | ND U   | mg/Kg | 0.20  | 0.02  | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Cobalt       | 6020A           | ND U   | mg/Kg | 0.020 | 0.003 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Copper       | 6020A           | ND U   | mg/Kg | 0.10  | 0.03  | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Iron         | 6010C           | 1.0 J  | mg/Kg | 8     | 1.0   | 1    | 08/30/18 15:51 | 08/29/18       |   |
| Lead         | 6020A           | ND U   | mg/Kg | 0.020 | 0.003 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Magnesium    | 6010C           | ND U   | mg/Kg | 1     | 0.6   | 1    | 08/30/18 15:51 | 08/29/18       |   |
| Manganese    | 6020A           | ND U   | mg/Kg | 0.05  | 0.010 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Nickel       | 6020A           | ND U   | mg/Kg | 0.20  | 0.02  | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Potassium    | 6010C           | ND U   | mg/Kg | 40    | 9     | 1    | 08/30/18 15:51 | 08/29/18       |   |
| Selenium     | 7742            | ND U   | mg/Kg | 0.10  | 0.05  | 5    | 08/31/18 11:32 | 08/29/18       |   |
| Silver       | 6020A           | ND U   | mg/Kg | 0.020 | 0.002 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Sodium       | 6010C           | ND U   | mg/Kg | 20    | 2     | 1    | 08/30/18 15:51 | 08/29/18       |   |
| Sulfur       | 6010C           | ND U   | mg/Kg | 8     | 1.0   | 1    | 08/30/18 15:51 | 08/29/18       |   |
| Thallium     | 6020A           | ND U   | mg/Kg | 0.020 | 0.002 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Uranium      | 6020A           | ND U   | mg/Kg | 0.020 | 0.002 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Vanadium     | 6020A           | ND U   | mg/Kg | 0.20  | 0.02  | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Zinc         | 6020A           | ND U   | mg/Kg | 0.5   | 0.08  | 5    | 08/30/18 17:50 | 08/29/18       |   |

no impact

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807185

ICP INTERFERENCE CHECK SAMPLE

Sample ID ICSA

Concentration Units: ug/L

| Analyte   | Method | Analysis Batch: | Result   | True Value | % Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|--------|-----------------|----------|------------|-------|------------------|----------------|
| Iron      | 6010C  | 604833          | 190000 ✓ | -          | 95 -  | 80-120           | 08/30/18 15:34 |
| Potassium | 6010C  | 604833          | 90 u     | -          | -     | -                | 08/30/18 15:34 |
| Sodium    | 6010C  | 604833          | 20 u     | -          | -     | -                | 08/30/18 15:34 |
| Sulfur    | 6010C  | 604833          | 10 u     | -          | -     | -                | 08/30/18 15:34 |

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807185

ICP INTERFERENCE CHECK SAMPLE

**Sample ID** ICSAB

**Concentration Units:** ug/L

| Analyte   | Method | Analysis Batch: | Result   | True Value | % Rec | % Rec. | Limits | Analysis Date  |
|-----------|--------|-----------------|----------|------------|-------|--------|--------|----------------|
|           |        |                 |          |            |       | Limits |        |                |
| Iron      | 6010C  | 604833          | 187000 ✓ | -          | 94    | -      | 80-120 | 08/30/18 15:36 |
| Potassium | 6010C  | 604833          | 90 U     | -          | -     | -      | -      | 08/30/18 15:36 |
| Sodium    | 6010C  | 604833          | 20 U     | -          | -     | -      | -      | 08/30/18 15:36 |
| Sulfur    | 6010C  | 604833          | 10 U     | -          | -     | -      | -      | 08/30/18 15:36 |

Sample Name: ICSA Acquired: 8/30/2018 15:34:00 Type: QC  
 Method: 2018A-6010-ICP04(v49) Mode: CONC Corr. Factor: 1.000000  
 User: admin Dilution: 1 Test Type: Sample Type:  
 Comment: ICP17-57-C

| Elem   | Al1670 | Al3944    | Sb2068 | As1890 | Ba4554 | Be2348  | B_2496 | Cd2144 |
|--------|--------|-----------|--------|--------|--------|---------|--------|--------|
| Units  | ppm    | ppm       | ppm    | ppm    | ppm    | ppm     | ppm    | ppm    |
| Avg    | 26.74  | 476.7     | .0039  | -.0081 | .0002  | -.00024 | -.2825 | .0046  |
| Stddev | .04    | 2.2       | .0038  | .0053  | .0002  | .00029  | .0063  | .0001  |
| %RSD   | .1562  | .4674 95% | 96.35  | 65.91  | 107.2  | 120.48  | 2.220  | 2.298  |

|    |       |       |       |        |       |         |        |       |
|----|-------|-------|-------|--------|-------|---------|--------|-------|
| #1 | 26.77 | 475.1 | .0013 | -.0118 | .0000 | -.00045 | -.2870 | .0045 |
| #2 | 26.71 | 478.2 | .0066 | -.0043 | .0003 | -.00004 | -.2781 | .0047 |

|         |      |      |      |      |      |      |      |      |
|---------|------|------|------|------|------|------|------|------|
| Check ? | None | None | None | None | None | None | None | None |
| Value   |      |      |      |      |      |      |      |      |
| Range   |      |      |      |      |      |      |      |      |

| Elem   | Cd2265 | Ca3158    | Ca3933 | Cr2677 | Co2307 | Cu2247 | Cu3273 | Fe2599 |
|--------|--------|-----------|--------|--------|--------|--------|--------|--------|
| Units  | ppm    | ppm       | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    |
| Avg    | -.0051 | 485.3     | *****  | -.0035 | -.0072 | .0400  | -.0060 | 189.7  |
| Stddev | .0001  | .3        | -----  | .0011  | .0002  | .0013  | .0003  | .3     |
| %RSD   | 1.027  | .0580 97% | -----  | 31.62  | 2.901  | 3.201  | 5.740  | .1511  |

|    |        |       |       |        |        |       |        |       |
|----|--------|-------|-------|--------|--------|-------|--------|-------|
| #1 | -.0052 | 485.1 | ----- | -.0043 | -.0073 | .0409 | -.0062 | 189.5 |
| #2 | -.0051 | 485.5 | ----- | -.0027 | -.0070 | .0391 | -.0057 | 189.9 |

|         |      |          |      |      |      |      |      |          |
|---------|------|----------|------|------|------|------|------|----------|
| Check ? | None | Chk Pass | None | None | None | None | None | Chk Pass |
| Value   |      |          |      |      |      |      |      |          |
| Range   |      |          |      |      |      |      |      |          |

| Elem   | Pb2203 | Li6707 | Mg2790 | Mg2795 | Mg2852  | Mn2576  | Mn2605 | Mo2020 |
|--------|--------|--------|--------|--------|---------|---------|--------|--------|
| Units  | ppm    | ppm    | ppm    | ppm    | ppm     | ppm     | ppm    | ppm    |
| Avg    | -.0043 | .0059  | 527.6  | 242.4  | 462.8   | -.01679 | .0034  | -.0034 |
| Stddev | .0001  | .0009  | .7     | .3     | 2.1 95% | .00000  | .0010  | .0003  |
| %RSD   | 3.406  | 15.84  | .1389  | .1235  | .4577   | .01491  | 28.86  | 8.308  |

|    |        |       |       |       |       |         |       |        |
|----|--------|-------|-------|-------|-------|---------|-------|--------|
| #1 | -.0044 | .0066 | 527.1 | 242.2 | 461.3 | -.01679 | .0027 | -.0036 |
| #2 | -.0042 | .0053 | 528.1 | 242.6 | 464.3 | -.01679 | .0041 | -.0032 |

|         |      |      |          |      |      |      |      |      |
|---------|------|------|----------|------|------|------|------|------|
| Check ? | None | None | Chk Pass | None | None | None | None | None |
| Value   |      |      |          |      |      |      |      |      |
| Range   |      |      |          |      |      |      |      |      |

Sample Name: ICSAB Acquired: 8/30/2018 15:36:45 Type: QC  
 Method: 2018A-6010-ICP04(v49) Mode: CONC Corr. Factor: 1.000000  
 User: admin Dilution: 1 Test Type: Sample Type:  
 Comment: ICP17-57-D

| Elem   | Al1670 | Al3944 | Sb2068 | As1890 | Ba4554 | Be2348 | B_2496 | Cd2144 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Units  | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    |
| Avg    | 26.89  | 473.2  | .9519  | -.0114 | .4952  | .52136 | -.2561 | .9691  |
| Stddev | .05    | 5.795% | .0100  | .0058  | .0018  | .00391 | .0046  | .0029  |
| %RSD   | .1762  | 1.208  | 1.051  | 50.92  | .3573  | .74996 | 1.808  | .3018  |

|    |       |       |       |        |       |        |        |       |
|----|-------|-------|-------|--------|-------|--------|--------|-------|
| #1 | 26.92 | 477.2 | .9590 | -.0156 | .4965 | .51860 | -.2593 | .9711 |
| #2 | 26.85 | 469.1 | .9448 | -.0073 | .4940 | .52413 | -.2528 | .9670 |

|             |      |      |          |      |          |          |      |          |
|-------------|------|------|----------|------|----------|----------|------|----------|
| Check ?     | None | None | Chk Pass | None | Chk Pass | Chk Pass | None | Chk Pass |
| Value Range |      |      |          |      |          |          |      |          |

| Elem   | Cd2265 | Ca3158 | Ca3933 | Cr2677 | Co2307 | Cu2247 | Cu3273 | Fe2599 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Units  | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    |
| Avg    | .9518  | 477.5  | ****   | .5025  | .4523  | .5100  | .4630  | 187.0  |
| Stddev | .0035  | 3.8    | 96%    | .0030  | .0012  | .0020  | .0022  | 1.4    |
| %RSD   | .3696  | .7903  | -----  | .5991  | .2678  | .3944  | .4649  | .7220  |

|    |       |       |       |       |       |       |       |       |
|----|-------|-------|-------|-------|-------|-------|-------|-------|
| #1 | .9543 | 480.2 | ----- | .5047 | .4532 | .5114 | .4614 | 188.0 |
| #2 | .9493 | 474.9 | ----- | .5004 | .4515 | .5086 | .4645 | 186.1 |

|             |          |          |      |          |          |          |          |          |
|-------------|----------|----------|------|----------|----------|----------|----------|----------|
| Check ?     | Chk Pass | Chk Pass | None | Chk Pass | Chk Pass | Chk Pass | Chk Pass | Chk Pass |
| Value Range |          |          |      |          |          |          |          |          |

| Elem   | Pb2203 | Li6707 | Mg2790 | Mg2795 | Mg2852 | Mn2576 | Mn2605 | Mo2020 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Units  | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    |
| Avg    | .9174  | .0035  | 519.3  | 241.2  | 460.8  | .47583 | .5293  | -.0029 |
| Stddev | .0052  | .0018  | 5.1    | 1.6    | 4.692% | .00034 | .0070  | .0003  |
| %RSD   | .5675  | 51.53  | .9814  | .6715  | .9898  | .07070 | 1.324  | 11.11  |

|    |       |       |       |       |       |        |       |        |
|----|-------|-------|-------|-------|-------|--------|-------|--------|
| #1 | .9211 | .0048 | 522.9 | 242.3 | 457.6 | .47607 | .5343 | -.0032 |
| #2 | .9138 | .0022 | 515.7 | 240.0 | 464.0 | .47559 | .5244 | -.0027 |

|             |          |      |          |      |      |          |          |      |
|-------------|----------|------|----------|------|------|----------|----------|------|
| Check ?     | Chk Pass | None | Chk Pass | None | None | Chk Pass | Chk Pass | None |
| Value Range |          |      |          |      |      |          |          |      |



ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807185

ICP INTERFERENCE CHECK SAMPLE

Sample ID ICSA

Concentration Units: ug/L

| Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|--------|-----------------|--------|------------|-------|------------------|----------------|
| Antimony  | 6020A  | 604807          | 0.09   | -          | -     | -                | 08/30/18 17:41 |
| Arsenic   | 6020A  | 604807          | 0.2    | -          | -     | -                | 08/30/18 17:41 |
| Barium    | 6020A  | 604807          | 0.27   | -          | -     | -                | 08/30/18 17:41 |
| Beryllium | 6020A  | 604807          | 0.016  | -          | -     | -                | 08/30/18 17:41 |
| Cadmium   | 6020A  | 604807          | 0.030  | -          | -     | -                | 08/30/18 17:41 |
| Chromium  | 6020A  | 604807          | 1.16   | -          | -     | -                | 08/30/18 17:41 |
| Cobalt    | 6020A  | 604807          | 1.16   | -          | -     | -                | 08/30/18 17:41 |
| Copper    | 6020A  | 604807          | 0.81   | -          | -     | -                | 08/30/18 17:41 |
| Lead      | 6020A  | 604807          | 0.149  | -          | -     | -                | 08/30/18 17:41 |
| Manganese | 6020A  | 604807          | 1.14   | -          | -     | -                | 08/30/18 17:41 |
| Nickel    | 6020A  | 604807          | 1.46   | -          | -     | -                | 08/30/18 17:41 |
| Silver    | 6020A  | 604807          | 0.010  | -          | -     | -                | 08/30/18 17:41 |
| Thallium  | 6020A  | 604807          | 0.011  | -          | -     | -                | 08/30/18 17:41 |
| Uranium   | 6020A  | 604807          | 0.009  | -          | -     | -                | 08/30/18 17:41 |
| Vanadium  | 6020A  | 604807          | 0.04   | -          | -     | -                | 08/30/18 17:41 |
| Zinc      | 6020A  | 604807          | 0.4    | -          | -     | -                | 08/30/18 17:41 |

Al 20000

Mo 50

low interferences in samples, no impact

ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807185

ICP INTERFERENCE CHECK SAMPLE

Sample ID ICSAB

Concentration Units: ug/L

| Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|--------|-----------------|--------|------------|-------|------------------|----------------|
| Antimony  | 6020A  | 604807          | 0.09   | -          | -     | -                | 08/30/18 17:44 |
| Arsenic   | 6020A  | 604807          | 23.5 ✓ | 25.0       | 94 ✓  | 80-120           | 08/30/18 17:44 |
| Barium    | 6020A  | 604807          | 0.27   | -          | -     | -                | 08/30/18 17:44 |
| Beryllium | 6020A  | 604807          | 0.016  | -          | -     | -                | 08/30/18 17:44 |
| Cadmium   | 6020A  | 604807          | 24.5   | 25.0       | 98    | 80-120           | 08/30/18 17:44 |
| Chromium  | 6020A  | 604807          | 45.6   | 50.0       | 91    | 80-120           | 08/30/18 17:44 |
| Cobalt    | 6020A  | 604807          | 44.5   | 50.0       | 89    | 80-120           | 08/30/18 17:44 |
| Copper    | 6020A  | 604807          | 41.9 ✓ | 50.0       | 84 ✓  | 80-120           | 08/30/18 17:44 |
| Lead      | 6020A  | 604807          | 0.159  | -          | -     | -                | 08/30/18 17:44 |
| Manganese | 6020A  | 604807          | 45.6   | 50.0       | 91    | 80-120           | 08/30/18 17:44 |
| Nickel    | 6020A  | 604807          | 43.7   | 50.0       | 87    | 80-120           | 08/30/18 17:44 |
| Silver    | 6020A  | 604807          | 11.2   | 12.5       | 90    | 80-120           | 08/30/18 17:44 |
| Thallium  | 6020A  | 604807          | 0.013  | -          | -     | -                | 08/30/18 17:44 |
| Uranium   | 6020A  | 604807          | 0.007  | -          | -     | -                | 08/30/18 17:44 |
| Vanadium  | 6020A  | 604807          | 46.1   | 50.0       | 92    | 80-120           | 08/30/18 17:44 |
| Zinc      | 6020A  | 604807          | 21.1 ✓ | 25.0       | 84 ✓  | 80-120           | 08/30/18 17:44 |

# Interference Check Solution A (ICS-A) Report

Sample Name ICSA  
 File Name 010\CSA.d  
 Data Path Name D:\Agilent\CPM\1\DATA\BatchTemplate\Experiments\083018A5.b  
 Acq Time 2018-08-30 5:41:30 PM  
 Sample Type ICSA  
 Comment ---  
 ISTD Ref FileName 003CALB.d  
 Operator ALKLS  
 NoUser

QC Analyte Table

| Name | Mass | ISTD | Tune Mode | Conc.      | Units | Conc. RSD | ExpValue | CPS     | QC Flag |
|------|------|------|-----------|------------|-------|-----------|----------|---------|---------|
| Be   | 9    | 6    | No Gas    | 0.0058     | ug/l  | 12.7      | -1       | 49      |         |
| Se   | 77   | 72   | H2        | 0.0688     | ug/l  | 28.0      | -1       | 31      |         |
| Se   | 78   | 72   | H2        | 0.0249     | ug/l  | 25.3      | -1       | 14      |         |
| Al   | 27   | 45   | He        | 20746.6394 | ug/l  | 0.6       | 20000    | 1553526 |         |
| V    | 51   | 72   | He        | 0.0364     | ug/l  | 7.1       | -1       | 102     |         |
| Cr   | 52   | 72   | He        | 1.1646     | ug/l  | 5.7       | -1       | 4962    |         |
| Cr   | 53   | 72   | He        | 1.1459     | ug/l  | 6.3       | -1       | 613     |         |
| Mn   | 55   | 72   | He        | 1.1379     | ug/l  | 3.3       | -1       | 1983    |         |
| Co   | 59   | 72   | He        | 1.1570     | ug/l  | 0.5       | -1       | 8019    |         |
| Ni   | 60   | 72   | He        | 1.4647     | ug/l  | 6.1       | -1       | 2867    |         |
| Ni   | 62   | 72   | He        | 1.3643     | ug/l  | 2.8       | -1       | 423     |         |
| Cu   | 63   | 72   | He        | 0.7556     | ug/l  | 2.0       | -1       | 4146    |         |
| Cu   | 65   | 72   | He        | 0.8136     | ug/l  | 2.4       | -1       | 2227    |         |
| Zn   | 66   | 72   | He        | 0.3848     | ug/l  | 9.4       | -1       | 297     |         |
| As   | 75   | 72   | He        | 0.2402     | ug/l  | 7.6       | -1       | 109     |         |
| Mo   | 95   | 115  | He        | 51.3304    | ug/l  | 0.6       | 50       | 117853  |         |
| Mo   | 98   | 115  | He        | 50.8424    | ug/l  | 1.8       | 50       | 201708  |         |
| Ag   | 107  | 115  | He        | 0.0099     | ug/l  | 5.1       | -1       | 99      |         |
| Ag   | 109  | 115  | He        | 0.0124     | ug/l  | 16.5      | -1       | 118     |         |
| Cd   | 111  | 115  | He        | 0.0300     | ug/l  | 16.7      | -1       | 33      |         |
| Cd   | 114  | 115  | He        | 0.0261     | ug/l  | 7.9       | -1       | 72      |         |
| Sb   | 121  | 115  | He        | 0.0920     | ug/l  | 10.9      | -1       | 204     |         |
| Sb   | 123  | 115  | He        | 0.0798     | ug/l  | 11.1      | -1       | 148     |         |
| Ba   | 137  | 115  | He        | 0.2687     | ug/l  | 12.1      | -1       | 186     |         |
| Tl   | 203  | 175  | He        | 0.0093     | ug/l  | 16.6      | -1       | 62      |         |
| Tl   | 205  | 175  | He        | 0.0109     | ug/l  | 21.8      | -1       | 168     |         |
| [Pb] | 206  | 175  | He        | 0.1519     | ug/l  | 16.5      | -1       | 749     |         |
| [Pb] | 207  | 175  | He        | 0.1471     | ug/l  | 11.1      | -1       | 652     |         |
| Pb   | 208  | 175  | He        | 0.1493     | ug/l  | 6.9       | -1       | 2991    |         |
| U    | 238  | 232  | He        | 0.0091     | ug/l  | 9.3       | -1       | 184     |         |

104%

103%

QC ISTD Table



Agilent Technologies

1 of 2

2018-08-30 5:43 PM

# Interference Check Solution AB (ICS-AB) Report

**Sample Name** ICSAB  
**File Name** 011ICSB.d  
**Data Path Name** D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\083018A5.b  
**Acq Time** 2018-08-30 5:44:36 PM  
**Sample Type** ICSB  
**Comment** ---  
**ISTD Ref FileName** 003CALB.d  
**Operator** ALKLS  
**NoUser**

QC Analyte Table

| Name | Mass | ISTD | Tune Mode | Conc.      | Units | Conc. RSD | ExpValue | CPS     | QC Flag |
|------|------|------|-----------|------------|-------|-----------|----------|---------|---------|
| Be   | 9    | 6    | No Gas    | 0.0053     | ug/l  | 18.1      | -1       | 47      |         |
| Se   | 77   | 72   | H2        | 23.5487    | ug/l  | 2.9       | 25       | 2936    |         |
| Se   | 78   | 72   | H2        | 23.8623    | ug/l  | 1.0       | 25       | 9421    |         |
| Al   | 27   | 45   | He        | 20739.8957 | ug/l  | 2.1       | 20000    | 1571819 |         |
| V    | 51   | 72   | He        | 46.0595    | ug/l  | 1.4       | 50       | 132682  |         |
| Cr   | 52   | 72   | He        | 45.6272    | ug/l  | 2.1       | 50       | 181316  |         |
| Cr   | 53   | 72   | He        | 45.9903    | ug/l  | 2.9       | 50       | 22527   |         |
| Mn   | 55   | 72   | He        | 45.6293    | ug/l  | 2.0       | 50       | 82461   |         |
| Co   | 59   | 72   | He        | 44.4736    | ug/l  | 1.8       | 50       | 320065  |         |
| Ni   | 60   | 72   | He        | 43.6924    | ug/l  | 2.1       | 50       | 88002   |         |
| Ni   | 62   | 72   | He        | 43.3206    | ug/l  | 2.8       | 50       | 13731   |         |
| Cu   | 63   | 72   | He        | 41.8186    | ug/l  | 2.2       | 50       | 236270  |         |
| Cu   | 65   | 72   | He        | 41.9205    | ug/l  | 2.4       | 50       | 117708  |         |
| Zn   | 66   | 72   | He        | 21.0941    | ug/l  | 3.0       | 25       | 16028   |         |
| As   | 75   | 72   | He        | 23.4871    | ug/l  | 2.3       | 25       | 9645    |         |
| Mo   | 95   | 115  | He        | 51.7636    | ug/l  | 0.8       | 50       | 119327  |         |
| Mo   | 98   | 115  | He        | 51.1543    | ug/l  | 0.6       | 50       | 203799  |         |
| Ag   | 107  | 115  | He        | 11.2343    | ug/l  | 1.0       | 12.5     | 96897   |         |
| Ag   | 109  | 115  | He        | 11.2462    | ug/l  | 0.6       | 12.5     | 92997   |         |
| Cd   | 111  | 115  | He        | 24.5374    | ug/l  | 0.9       | 25       | 26379   |         |
| Cd   | 114  | 115  | He        | 24.6469    | ug/l  | 1.3       | 25       | 64505   |         |
| Sb   | 121  | 115  | He        | 0.0906     | ug/l  | 11.9      | -1       | 202     |         |
| Sb   | 123  | 115  | He        | 0.0817     | ug/l  | 16.2      | -1       | 152     |         |
| Ba   | 137  | 115  | He        | 0.2700     | ug/l  | 5.5       | -1       | 188     |         |
| Tl   | 203  | 175  | He        | 0.0140     | ug/l  | 15.6      | -1       | 92      |         |
| Tl   | 205  | 175  | He        | 0.0134     | ug/l  | 13.7      | -1       | 206     |         |
| [Pb] | 206  | 175  | He        | 0.1672     | ug/l  | 5.8       | -1       | 830     |         |
| [Pb] | 207  | 175  | He        | 0.1618     | ug/l  | 5.5       | -1       | 721     |         |
| Pb   | 208  | 175  | He        | 0.1589     | ug/l  | 2.2       | -1       | 3202    |         |
| U    | 238  | 232  | He        | 0.0070     | ug/l  | 5.4       | -1       | 146     |         |

104%

104%

QC ISTD Table



Agilent Technologies

1 of 2

2018-08-30 5:46 PM

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A  
Sample Matrix: Fish Tissue

Service Request: K1807185  
Date Collected: 07/25/18  
Date Received: 07/28/18  
Date Analyzed: 08/30/18 - 08/31/18

Duplicate Matrix Spike Summary  
Total Metals

Sample Name: EPA-NP-A1  
Lab Code: K1807185-006 ✓

Units: mg/Kg  
Basis: Dry

Matrix Spike  
KQ1811997-05

Duplicate Matrix Spike  
KQ1811997-06

| Analyte Name | Method | Sample Result ✓ | Result | Spike Amount | % Rec  | Result | Spike Amount | % Rec  | % Rec Limits | RPD ✓ | RPD Limit |
|--------------|--------|-----------------|--------|--------------|--------|--------|--------------|--------|--------------|-------|-----------|
| Aluminum     | 6010C  | ND U            | 187 ✓  | 199          | 94 ✓   | 185    | 199          | 93     | 75-125 ✓     | 1     | 20 ✓      |
| Antimony     | 6020A  | ND U            | 49.1   | 49.8         | 99     | 49.2   | 49.7         | 99     | 75-125       | <1    | 20        |
| Arsenic      | 6020A  | 0.30 J          | 16.9   | 16.6         | 100    | 17.5   | 16.6         | 104    | 75-125       | 3     | 20        |
| Barium       | 6020A  | 0.305           | 95.7   | 99.7         | 96     | 96.1   | 99.3         | 96     | 75-125       | <1    | 20        |
| Beryllium    | 6020A  | ND U            | 4.86 ✓ | 4.98         | 97 ✓   | 4.85   | 4.97         | 98     | 75-125       | <1    | 20        |
| Cadmium      | 6020A  | 0.010 J         | 4.89   | 4.98         | 98     | 4.93   | 4.97         | 99     | 75-125       | <1    | 20        |
| Calcium      | 6010C  | 2120            | 1500   | 166          | -379 # | 1400   | 166          | -434 # | 75-125       | 7     | 20        |
| Chromium     | 6020A  | 0.58            | 19.4   | 19.9         | 95     | 19.7 ✓ | 19.9         | 96 ✓   | 75-125       | 2     | 20        |
| Cobalt       | 6020A  | 0.023           | 47.1   | 49.8         | 95     | 47.5   | 49.7         | 96     | 75-125       | <1    | 20        |
| Copper       | 6020A  | 1.76            | 24.5   | 24.9         | 91     | 24.7   | 24.8         | 92     | 75-125       | <1    | 20        |
| Iron         | 6010C  | 26.9            | 122 ✓  | 99.7         | 95 ✓   | 120    | 99.3         | 94     | 75-125       | 2     | 20        |
| Lead         | 6020A  | 0.011 J         | 46.9   | 49.8         | 94     | 47.6   | 49.7         | 96     | 75-125       | 1     | 20        |
| Magnesium    | 6010C  | 1450            | 1580   | 166          | 75 #   | 1570   | 166          | 71 #   | 75-125       | <1    | 20        |
| Manganese    | 6020A  | 1.81            | 47.5   | 49.8         | 92     | 48.4   | 49.7         | 94     | 75-125       | 2     | 20        |
| Nickel       | 6020A  | 0.28            | 47.3   | 49.8         | 94     | 47.5   | 49.7         | 95     | 75-125       | <1    | 20        |
| Potassium    | 6010C  | 20000           | 19900  | 166          | -70 #  | 19800  | 166          | -116 # | 75-125       | <1    | 20        |
| Selenium     | 7742   | 3.40            | 15.7 ✓ | 16.6         | 74 N ✓ | 15.6 ✓ | 16.6         | 74 N ✓ | 75-125       | <1    | 20        |
| Silver       | 6020A  | 0.005 J         | 5.51   | 4.98         | 111    | 5.60   | 4.97         | 113    | 75-125       | 2     | 20        |
| Sodium       | 6010C  | 2030            | 2160   | 166          | 81 #   | 2160   | 166          | 76 #   | 75-125       | <1    | 20        |
| Sulfur       | 6010C  | 9530            | 10400  | 997          | 83 #   | 10300  | 993          | 75 #   | 75-125       | <1    | 20        |
| Thallium     | 6020A  | 0.057           | 3.30   | 3.32         | 98     | 3.40   | 3.31         | 101    | 75-125       | 3     | 20        |
| Uranium      | 6020A  | ND U            | 3.24   | 3.32         | 98     | 3.33 ✓ | 3.31         | 101 ✓  | 75-125       | 3     | 20        |
| Vanadium     | 6020A  | ND U            | 47.6   | 49.8         | 96     | 48.7   | 49.7         | 98     | 75-125       | 2     | 20        |
| Zinc         | 6020A  | 23.2            | 67.5   | 49.8         | 89     | 68.8   | 49.7         | 92     | 75-125       | 2     | 20        |

J- Se in all

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Printed 9/25/2018 11:50:51 AM

Superset Reference:

ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807185

POST SPIKE SAMPLE RECOVERY

Concentration Units: ug/L

| Sample ID     | Analyte   | Method | Analysis Batch: | Initial Sample Result | Post Spike Result | True Value | % Rec | % Rec. Limits | Analysis Date  |
|---------------|-----------|--------|-----------------|-----------------------|-------------------|------------|-------|---------------|----------------|
| K1807185-006A |           |        |                 |                       |                   |            |       |               |                |
|               | Antimony  | 6020A  | 604807          | 0.005 U               | 48.2              | 50.0       | 96    | 80-120        | 08/30/18 18:09 |
|               | Arsenic   | 6020A  | 604807          | 0.6 J                 | 50.0              | 50.0       | 99    | 80-120        | 08/30/18 18:09 |
|               | Barium    | 6020A  | 604807          | 0.61                  | 48.6              | 50.0       | 96    | 80-120        | 08/30/18 18:09 |
|               | Beryllium | 6020A  | 604807          | 0.008 U               | 48.6              | 50.0       | 97    | 80-120        | 08/30/18 18:09 |
|               | Cadmium   | 6020A  | 604807          | 0.02 J                | 48.3              | 50.0       | 97    | 80-120        | 08/30/18 18:09 |
|               | Chromium  | 6020A  | 604807          | 1.2                   | 47.9              | 50.0       | 93    | 80-120        | 08/30/18 18:09 |
|               | Cobalt    | 6020A  | 604807          | 0.05                  | 46.6              | 50.0       | 93    | 80-120        | 08/30/18 18:09 |
|               | Copper    | 6020A  | 604807          | 3.5                   | 49.6              | 50.0       | 92    | 80-120        | 08/30/18 18:09 |
|               | Lead      | 6020A  | 604807          | 0.02 J                | 46.4              | 50.0       | 93    | 80-120        | 08/30/18 18:09 |
|               | Manganese | 6020A  | 604807          | 3.61                  | 50.1              | 50.0       | 93    | 80-120        | 08/30/18 18:09 |
|               | Nickel    | 6020A  | 604807          | 0.6                   | 46.7              | 50.0       | 92    | 80-120        | 08/30/18 18:09 |
|               | Silver    | 6020A  | 604807          | 0.009 J               | 9.44              | 10.0       | 94    | 80-120        | 08/30/18 18:09 |
|               | Thallium  | 6020A  | 604807          | 0.11                  | 47.0              | 50.0       | 94    | 80-120        | 08/30/18 18:09 |
|               | Uranium   | 6020A  | 604807          | 0.002 U               | 47.0              | 50.0       | 94    | 80-120        | 08/30/18 18:09 |
|               | Vanadium  | 6020A  | 604807          | 0.02 U                | 47.1              | 50.0       | 94    | 80-120        | 08/30/18 18:09 |
|               | Zinc      | 6020A  | 604807          | 46.5                  | 91.8              | 50.0       | 91    | 80-120        | 08/30/18 18:09 |

Results flagged with a pound (#) indicate the control criteria is not applicable.

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish tissue

**Service Request:** K1807185  
**Date Collected:** 07/26/18  
**Date Received:** 07/28/18  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30-31/18

Triplicate Summary  
Total Metals

**Sample Name:** Batch QC  
**Lab Code:** KQ1811997-09  
**Test Notes:**

*Teck  
sample*

**Units:** mg/Kg  
**Basis:** Dry

| Analyte   | Analysis Method | MRL  | Sample Result | Duplicate Sample | Triplicate Sample | Average | Relative Standard Deviation | Result Notes |
|-----------|-----------------|------|---------------|------------------|-------------------|---------|-----------------------------|--------------|
|           |                 |      |               | KQ1811997-08     | KQ1811997-09      |         |                             |              |
| Aluminum  | 6010C           | 1.0  | ND U          | 0.4 J            | 0.5 J             | NC      | NC                          |              |
| Antimony  | 6020A           | 0.05 | ND U          | ND U             | ND U              | ND      | -                           |              |
| Arsenic   | 6020A           | 0.5  | 0.42 J        | 0.41 J           | 0.42 J            | 0.42    | 1.7                         |              |
| Barium    | 6020A           | 0.05 | 0.165         | 0.162            | 0.234             | 0.187   | 21.8                        | #            |
| Beryllium | 6020A           | 0.02 | ND U          | ND U             | ND U              | ND      | -                           |              |
| Cadmium   | 6020A           | 0.02 | 0.004 J       | 0.004 J          | 0.003 J           | 0.004   | 15.7                        |              |
| Calcium   | 6010C           | 4.0  | 730           | 1120             | 1340              | 1060    | 29.1                        | *            |
| Chromium  | 6020A           | 0.2  | 0.26          | 0.26             | 0.28              | 0.27    | 4.3                         |              |
| Cobalt    | 6020A           | 0.02 | 0.014 J       | 0.011 J          | 0.014 J           | 0.013   | 13.3                        |              |
| Copper    | 6020A           | 0.1  | 1.27          | 1.34             | 1.30              | 1.30    | 2.7                         |              |
| Iron      | 6010C           | 8    | 9.4           | 10.1             | 10.0              | 9.8     | 3.9                         |              |
| Lead      | 6020A           | 0.02 | 0.008 J       | 0.007 J          | 0.008 J           | 0.008   | 7.5                         |              |
| Magnesium | 6010C           | 1.0  | 1350          | 1370             | 1360              | 1360    | 0.7                         |              |
| Manganese | 6020A           | 0.05 | 1.04          | 1.15             | 1.31              | 1.17    | 11.6                        |              |
| Nickel    | 6020A           | 0.2  | 0.15 J        | 0.14 J           | 0.14 J            | 0.14    | 4.0                         |              |
| Potassium | 6010C           | 40   | 19200         | 19500            | 19300             | 19300   | 0.8                         |              |
| Selenium  | 7742            | 0.1  | 3.40          | 3.74             | 3.38              | 3.51    | 5.8                         |              |
| Silver    | 6020A           | 0.02 | ND U          | 0.002 J          | ND U              | NC      | NC                          |              |
| Sodium    | 6010C           | 20   | 1500          | 1510             | 1500              | 1500    | 0.4                         |              |
| Sulfur    | 6010C           | 8.0  | 9370          | 9440             | 9360              | 9390    | 0.5                         |              |
| Thallium  | 6020A           | 0.02 | 0.043         | 0.044            | 0.047             | 0.045   | 4.7                         |              |
| Uranium   | 6020A           | 0.02 | ND U          | ND U             | ND U              | ND      | -                           |              |
| Vanadium  | 6020A           | 0.2  | ND U          | ND U             | ND U              | ND      | -                           |              |
| Zinc      | 6020A           | 0.5  | 20.3          | 20.6             | 21.3              | 20.7    | 2.5                         |              |

*530 ✓*

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish Tissue

**Service Request:** K1807185  
**Date Analyzed:** 08/30/18

**Lab Control Sample Summary**  
**Total Metals**

**Units:**mg/Kg

**Basis:**Dry

**Lab Control Sample**  
KQ1811997-02

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|--------------|-------------------|--------|--------------|-------|--------------|
| Aluminum     | 6010C             | 193 ✓  | 200          | 97 ✓  | 80-120 ✓     |
| Calcium      | 6010C             | 169    | 167          | 101   | 80-120       |
| Iron         | 6010C             | 99.7   | 100          | 100   | 80-120       |
| Magnesium    | 6010C             | 169    | 167          | 101   | 80-120       |
| Potassium    | 6010C             | 177 ✓  | 167          | 106 ✓ | 80-120       |
| Sodium       | 6010C             | 164    | 167          | 98    | 80-120       |
| Sulfur       | 6010C             | 960    | 1000         | 96    | 80-120       |



ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish Tissue

**Service Request:** K1807185  
**Date Analyzed:** 08/30/18

**Lab Control Sample Summary**  
**Total Metals**

**Units:**mg/Kg  
**Basis:**Dry

**Lab Control Sample**  
KQ1811997-02

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|--------------|-------------------|--------|--------------|-------|--------------|
| Antimony     | 6020A             | 48.4   | 50.0         | 97    | 80-120 ✓     |
| Arsenic      | 6020A             | 16.4   | 16.7         | 99    | 80-120       |
| Barium       | 6020A             | 96.6 ✓ | 100          | 97 ✓  | 80-120       |
| Beryllium    | 6020A             | 4.85   | 5.00         | 97    | 80-120       |
| Cadmium      | 6020A             | 4.81   | 5.00         | 96    | 80-120       |
| Chromium     | 6020A             | 19.2   | 20.0         | 96    | 80-120       |
| Cobalt       | 6020A             | 47.8   | 50.0         | 96    | 80-120       |
| Copper       | 6020A             | 23.7   | 25.0         | 95    | 80-120       |
| Lead         | 6020A             | 47.8 ✓ | 50.0         | 96 ✓  | 80-120       |
| Manganese    | 6020A             | 47.5   | 50.0         | 95    | 80-120       |
| Nickel       | 6020A             | 47.6   | 50.0         | 95    | 80-120       |
| Silver       | 6020A             | 5.62   | 5.00         | 112   | 80-120       |
| Thallium     | 6020A             | 3.32   | 3.33         | 100   | 80-120       |
| Uranium      | 6020A             | 3.15 ✓ | 3.33         | 95 ✓  | 80-120       |
| Vanadium     | 6020A             | 47.8   | 50.0         | 96    | 80-120       |
| Zinc         | 6020A             | 45.9   | 50.0         | 92    | 80-120       |

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish Tissue

**Service Request:** K1807185  
**Date Analyzed:** 08/31/18

**Lab Control Sample Summary**  
**Total Metals**

**Units:**mg/Kg  
**Basis:**Dry

**Lab Control Sample**  
KQ1811997-02

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|--------------|-------------------|--------|--------------|-------|--------------|
| Selenium     | 7742              | 15.8 ✓ | 16.7         | 95 ✓  | 80-120       |

**ALS Group USA, Corp.**  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**LCS Matrix:** Tissue

**Service Request:** K1807185  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30-31/18

Standard Reference Material Summary  
Total Metals

**Sample Name:** Standard Reference Material  
**Lab Code:** KQ1811997-03 ✓  
**Test Notes:** Dorm-4 Solids = 94.5%

**Units:** mg/Kg (ppm)  
**Basis:** Dry

**Source:** N.R.C.C. Dorm-4

| Analyte  | Prep Method | Analysis Method | True Value | Result | Percent Recovery | Control Limits ✓ | Result Notes |
|----------|-------------|-----------------|------------|--------|------------------|------------------|--------------|
| Arsenic  | PSEP Tissue | 6020A           | 6.8        | 7.0 ✓  | 103 ✓            | 4.93-8.93        |              |
| Cadmium  | PSEP Tissue | 6020A           | 0.306      | 0.306  | 100              | 0.233 - 0.385    |              |
| Chromium | PSEP Tissue | 6020A           | 1.87       | 1.78   | 95               | 1.37-2.44        |              |
| Copper   | PSEP Tissue | 6020A           | 15.9       | 15.0   | 94               | 12.0 - 20.2      |              |
| Iron     | PSEP Tissue | 6010C           | 341        | 338 ✓  | 99 ✓             | 251-442          |              |
| Lead     | PSEP Tissue | 6020A           | 0.416      | 0.372  | 89               | 0.290 - 0.563    |              |
| Nickel   | PSEP Tissue | 6020A           | 1.36       | 1.38   | 101              | 0.912-1.9        |              |
| Selenium | PSEP Tissue | 7742            | 3.56       | 3.78 ✓ | 106 ✓            | 2.58 - 4.68      |              |
| Zinc     | PSEP Tissue | 6020A           | 52.20      | 49.9   | 96               | 39.2 - 66.5      |              |

**ALS Group USA, Corp.**  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**LCS Matrix:** Tissue

**Service Request:** K1807185  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30-31/18

Standard Reference Material Summary  
Total Metals

**Sample Name:** Standard Reference Material  
**Lab Code:** KQ1811997-04  
**Test Notes:** Tort-3 Solids = 99.1%

**Units:** mg/Kg (ppm)  
**Basis:** Dry

**Source:** N.R.C.C. Tort-3

| Analyte   | Prep Method | Analysis Method | True Value | Result | Percent Recovery | Control Limits | Result Notes |
|-----------|-------------|-----------------|------------|--------|------------------|----------------|--------------|
| Arsenic   | PSEP Tissue | 6020A           | 59.5       | 63.7   | 107              | 44.6-76.0      |              |
| Cadmium   | PSEP Tissue | 6020A           | 42.3       | 40.5   | 96               | 32.4-52.9      |              |
| Chromium  | PSEP Tissue | 6020A           | 1.95       | 1.66 ✓ | 85 ✓             | 1.37-2.63      |              |
| Copper    | PSEP Tissue | 6020A           | 497        | 460    | 93               | 380-623        |              |
| Iron      | PSEP Tissue | 6010C           | 179        | 165 ✓  | 92 ✓             | 137-224        |              |
| Lead      | PSEP Tissue | 6020A           | 0.225      | 0.188  | 84               | 0.166-0.292    |              |
| Manganese | PSEP Tissue | 6020A           | 15.6       | 13.7   | 88               | 11.7-19.9      |              |
| Nickel    | PSEP Tissue | 6020A           | 5.3        | 4.7 ✓  | 89 ✓             | 4.05-6.65      |              |
| Selenium  | PSEP Tissue | 7742            | 10.9       | 11.2 ✓ | 110 ✓            | 7.9-14.3       |              |
| Vanadium  | PSEP Tissue | 6020A           | 9.1        | 8.4    | 92               | 7.0-11.4       |              |
| Zinc      | PSEP Tissue | 6020A           | 136        | 120 ✓  | 88 ✓             | 104-170        |              |

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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807185

ICP SERIAL DILUTIONS

Concentration Units: ug/L

| Sample ID       | Analyte   | Method | Analysis Batch:        | Initial Sample Result | Serial Dillution Result | % Diff      | % Diff. Limit | Analysis Date  |
|-----------------|-----------|--------|------------------------|-----------------------|-------------------------|-------------|---------------|----------------|
| K1807185-006SDL |           |        |                        |                       |                         |             |               |                |
|                 | Aluminum  | 6010C  | 604833 <i>&lt; 50x</i> | 2                     | 27 J                    | 1588        | 10            | 08/30/18 16:03 |
|                 | Calcium   | 6010C  | 604833                 | 21200                 | 21900 ✓                 | 3 ✓         | 10            | 08/30/18 16:03 |
|                 | Iron      | 6010C  | 604833 "               | 270                   | 370 J                   | 39          | 10            | 08/30/18 16:03 |
|                 | Magnesium | 6010C  | 604833                 | 14500                 | 14200                   | 2           | 10            | 08/30/18 16:03 |
|                 | Potassium | 6010C  | 604833                 | 200000                | 192000                  | 4           | 10            | 08/30/18 16:03 |
|                 | Sodium    | 6010C  | 604833                 | 20300                 | 19400 ✓                 | 4 ✓         | 10            | 08/30/18 16:03 |
|                 | Sulfur    | 6010C  | 604833                 | 95300                 | 92900                   | 2           | 10            | 08/30/18 16:03 |
| K1807185-006SDL |           |        |                        |                       |                         |             |               |                |
|                 | Antimony  | 6020A  | 604807                 | 0.005 U               | 2.1 J                   | 6818        | 10            | 08/30/18 18:06 |
|                 | Arsenic   | 6020A  | 604807                 | 3                     | 26                      | 772         | 10            | 08/30/18 18:06 |
|                 | Barium    | 6020A  | 604807                 | 3.0                   | 3.5                     | 14          | 10            | 08/30/18 18:06 |
|                 | Beryllium | 6020A  | 604807                 | 0.008 U               | 0.02 U                  | -421        | 10            | 08/30/18 18:06 |
|                 | Cadmium   | 6020A  | 604807                 | 0.10                  | 0.2 J                   | 121         | 10            | 08/30/18 18:06 |
|                 | Chromium  | 6020A  | 604807                 | 6                     | 5 J                     | 22          | 10            | 08/30/18 18:06 |
|                 | Cobalt    | 6020A  | 604807                 | 0.2                   | 0.3 J                   | 21          | 10            | 08/30/18 18:06 |
|                 | Copper    | 6020A  | 604807 <i>@ 5x</i>     | 17.6                  | 25.1 ✓                  | <i>(43)</i> | 10            | 08/30/18 18:06 |
|                 | Lead      | 6020A  | 604807                 | 0.1                   | 0.4 J                   | 213         | 10            | 08/30/18 18:06 |
|                 | Manganese | 6020A  | 604807                 | 18.1                  | 20.0 ✓                  | <i>(11)</i> | 10            | 08/30/18 18:06 |
|                 | Nickel    | 6020A  | 604807                 | 3                     | 4 J                     | 29          | 10            | 08/30/18 18:06 |
|                 | Silver    | 6020A  | 604807                 | 0.05                  | 0.6 J                   | 1212        | 10            | 08/30/18 18:06 |
|                 | Thallium  | 6020A  | 604807                 | 0.6                   | 0.8 J                   | 35          | 10            | 08/30/18 18:06 |
|                 | Uranium   | 6020A  | 604807                 | 0.002 U               | 0.03 U                  | 686         | 10            | 08/30/18 18:06 |
|                 | Vanadium  | 6020A  | 604807                 | 0.02 U                | 6 J                     | 5383        | 10            | 08/30/18 18:06 |
|                 | Zinc      | 6020A  | 604807                 | 232                   | 267 ✓                   | <i>(15)</i> | 10            | 08/30/18 18:06 |

*all 6020 exc. Cu, Mn, Zn  
init < 50x DL*

*J Cu, Mn, Zn in all*

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807185

**Detection Limits**

**Instrument:** K-ICP-AES-04

**Matrix:** Fish Tissue

| Analyte   | Wavelength<br>(nm) | Units | MRL | MDL | Method |
|-----------|--------------------|-------|-----|-----|--------|
| Aluminum  | 1670               | ug/L  | 10  | 3   | 6010C  |
| Calcium   | 3158               | ug/L  | 40  | 20  | 6010C  |
| Iron      | 2599               | ug/L  | 80  | 10  | 6010C  |
| Magnesium | 2852               | ug/L  | 10  | 6   | 6010C  |
| Potassium | 7664               | ug/L  | 400 | 90  | 6010C  |
| Sodium    | 5895               | ug/L  | 200 | 20  | 6010C  |
| Sulfur    | 1820               | ug/L  | 80  | 10  | 6010C  |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807185

**Detection Limits**

**Instrument:** K-ICP-MS-06

**Matrix:** Fish Tissue

| Analyte   | Mass | Units | MRL  | MDL   | Method |
|-----------|------|-------|------|-------|--------|
| Antimony  | 121  | ug/L  | 0.1  | 0.01  | 6020A  |
| Arsenic   | 75   | ug/L  | 1    | 0.04  | 6020A  |
| Barium    | 137  | ug/L  | 0.1  | 0.04  | 6020A  |
| Beryllium | 9    | ug/L  | 0.04 | 0.016 | 6020A  |
| Cadmium   | 111  | ug/L  | 0.04 | 0.006 | 6020A  |
| Chromium  | 52   | ug/L  | 0.4  | 0.04  | 6020A  |
| Cobalt    | 59   | ug/L  | 0.04 | 0.006 | 6020A  |
| Copper    | 65   | ug/L  | 0.2  | 0.06  | 6020A  |
| Lead      | 208  | ug/L  | 0.04 | 0.006 | 6020A  |
| Manganese | 55   | ug/L  | 0.1  | 0.02  | 6020A  |
| Nickel    | 60   | ug/L  | 0.4  | 0.04  | 6020A  |
| Silver    | 107  | ug/L  | 0.04 | 0.004 | 6020A  |
| Thallium  | 205  | ug/L  | 0.04 | 0.004 | 6020A  |
| Uranium   | 238  | ug/L  | 0.04 | 0.004 | 6020A  |
| Vanadium  | 51   | ug/L  | 0.4  | 0.04  | 6020A  |
| Zinc      | 66   | ug/L  | 1    | 0.16  | 6020A  |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807185

**Detection Limits**

**Instrument:** K-FLAA-02

**Matrix:** Fish Tissue

| Analyte  | Wavelength<br>(nm) | Units | MRL | MDL | Method |
|----------|--------------------|-------|-----|-----|--------|
| Selenium | 196.0              | ug/L  | 0.2 | 0.1 | 7742   |



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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807185

**ICP Linear Range (Quarterly)**

**Instrument:** K-ICP-AES-04

| Analyte        | Concentration (ug/L) | Method |
|----------------|----------------------|--------|
| Aluminum 1670  | 2000                 | 6010C  |
| Aluminum 3944  | 270000               | 6010C  |
| Calcium 3158   | 450000               | 6010C  |
| Calcium 3933   | 8000                 | 6010C  |
| Iron 2599      | 360000               | 6010C  |
| Magnesium 2790 | 450000               | 6010C  |
| Magnesium 2795 | 8000                 | 6010C  |
| Magnesium 2852 | 90000                | 6010C  |
| Potassium 7664 | 450000               | 6010C  |
| Sodium 5895    | 450000               | 6010C  |
| Sulfur 1820    | 450000               | 6010C  |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807185

**ICP Linear Range (Quarterly)**

**Instrument:** K-ICP-MS-06

| Analyte      | Concentration (ug/L) | Method |
|--------------|----------------------|--------|
| Antimony 121 | 4500                 | 6020A  |
| Arsenic 75   | 4500                 | 6020A  |
| Barium 137   | 9000                 | 6020A  |
| Beryllium 9  | 9000                 | 6020A  |
| Cadmium 111  | 9000                 | 6020A  |
| Chromium 52  | 9000                 | 6020A  |
| Cobalt 59    | 9000                 | 6020A  |
| Copper 65    | 4500                 | 6020A  |
| Lead 208     | 2700                 | 6020A  |
| Manganese 55 | 9000                 | 6020A  |
| Nickel 60    | 4500                 | 6020A  |
| Silver 107   | 900                  | 6020A  |
| Thallium 205 | 2700                 | 6020A  |
| Uranium 238  | 9000                 | 6020A  |
| Vanadium 51  | 9000                 | 6020A  |
| Zinc 66      | 9000                 | 6020A  |

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Prep Summary Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish Tissue

**Service Request:** K1807185

**Metals**

**Prep Method:** PSEP Metals  
**Analytical Method:** 6010C/6020A/7742

**Extraction Lot:** 320955  
**Extraction Date:** 08/29/18 19:30 ✓

| Sample Name                 | Lab Code        | Date Collected | Date Received | Sample Amount ✓ | Final Amount ✓ | Percent Solids |
|-----------------------------|-----------------|----------------|---------------|-----------------|----------------|----------------|
| EPA-NP-A1                   | K1807185-006    | 7/25/18        | 7/28/18       | 0.300 g         | 30 mL          |                |
| EPA-NP-A2                   | K1807185-012    | 7/25/18        | 7/28/18       | 0.301 g         | 30 mL          |                |
| EPA-NP-A3                   | K1807185-018    | 7/26/18        | 7/28/18       | 0.301 g         | 30 mL          |                |
| EPA-NP-A4                   | K1807185-024    | 7/26/18        | 7/28/18       | 0.302 g         | 30 mL          |                |
| EPA-NP-A5                   | K1807185-030    | 7/26/18        | 7/28/18       | 0.301 g         | 30 mL          |                |
| EPA-NP-A6                   | K1807185-036    | 7/26/18        | 7/28/18       | 0.301 g         | 30 mL          |                |
| Method Blank                | KQ1811997-01MB  | NA             | NA            | 0.300 g         | 30 mL          |                |
| Lab Control Sample          | KQ1811997-02LCS | NA             | NA            | 0.300 g         | 30 mL          |                |
| Matrix Spike                | KQ1811997-05MS  | 7/25/18        | 7/28/18       | 0.301 g         | 30 mL          |                |
| Duplicate Matrix Spike      | KQ1811997-06DMS | 7/25/18        | 7/28/18       | 0.302 g         | 30 mL          |                |
| Duplicate                   | KQ1811997-08DUP | NA             | NA            | 0.300 g         | 30 mL          |                |
| Triplicate                  | KQ1811997-09TRP | NA             | NA            | 0.301 g         | 30 mL          |                |
| Standard Reference Material | KQ1811997-03SRM | NA             | NA            | 0.302 g         | 30 mL          |                |
| Standard Reference Material | KQ1811997-04SRM | NA             | NA            | 0.301 g         | 30 mL          |                |

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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807185

Analysis Run Log

Instrument ID: K-ICP-AES-04

Analytical BatchID: 604833

| Sample                         | Dilution Factor | Date/Time      | A | C | F | M | K | N | S |
|--------------------------------|-----------------|----------------|---|---|---|---|---|---|---|
| ZZZZZZ                         | 1               | 08/30/18 14:35 |   |   |   |   |   |   |   |
| ZZZZZZ                         | 1               | 08/30/18 14:37 |   |   |   |   |   |   |   |
| ZZZZZZ                         | 1               | 08/30/18 14:39 |   |   |   |   |   |   |   |
| ICVB                           | 1               | 08/30/18 14:42 | X | X |   | X |   |   | X |
| ICV                            | 1               | 08/30/18 14:44 | X | X | X | X | X | X |   |
| ICB                            | 1               | 08/30/18 14:46 | X | X | X | X | X | X | X |
| LLICV                          | 1               | 08/30/18 14:49 | X | X |   | X | X | X |   |
| LLICV                          | 0.5             | 08/30/18 14:51 |   |   | X |   |   |   | X |
| CCVB1                          | 1               | 08/30/18 14:54 | X | X | X | X | X | X | X |
| CCVA1                          | 1               | 08/30/18 14:56 | X | X |   | X |   |   |   |
| ZZZZZZ                         | 1               | 08/30/18 14:59 |   |   |   |   |   |   |   |
| CCB                            | 1               | 08/30/18 15:29 | X | X | X | X | X | X | X |
| ICSA                           | 1               | 08/30/18 15:34 |   |   | X |   | X | X | X |
| ICSAB                          | 1               | 08/30/18 15:36 |   |   | X |   | X | X | X |
| KQ1811997-01MB                 | 1               | 08/30/18 15:51 | X | X | X | X | X | X | X |
| KQ1811997-02LCS                | 1               | 08/30/18 15:54 | X | X | X | X | X | X | X |
| ZZZZZZ -03 SRM                 | 1               | 08/30/18 15:56 |   |   |   |   |   |   |   |
| ZZZZZZ -04 SRM                 | 1               | 08/30/18 15:58 |   |   |   |   |   |   |   |
| K1807185-006                   | 1               | 08/30/18 16:01 | X | X | X | X | X | X | X |
| K1807185-006SDL                | 5               | 08/30/18 16:03 | X | X | X | X | X | X | X |
| KQ1811997-02LCS                | 1               | 08/30/18 16:05 | X | X | X | X | X | X | X |
| K1807185-006MS                 | 1               | 08/30/18 16:08 | X | X | X | X | X | X | X |
| K1807185-006DMS                | 1               | 08/30/18 16:10 | X | X | X | X | X | X | X |
| K1807185-012                   | 1               | 08/30/18 16:12 | X | X | X | X | X | X | X |
| CCVB                           | 1               | 08/30/18 16:15 | X | X | X | X | X | X | X |
| ZZZZZZ                         | 1               | 08/30/18 16:17 |   |   |   |   |   |   |   |
| CCVA                           | 1               | 08/30/18 16:19 | X | X |   | X |   |   |   |
| CCB                            | 1               | 08/30/18 16:22 | X | X | X | X | X | X | X |
| K1807185-018                   | 1               | 08/30/18 16:25 | X | X | X | X | X | X | X |
| K1807185-024                   | 1               | 08/30/18 16:27 | X | X | X | X | X | X | X |
| K1807185-030                   | 1               | 08/30/18 16:30 | X | X | X | X | X | X | X |
| K1807185-036                   | 1               | 08/30/18 16:32 | X | X | X | X | X | X | X |
| ZZZZZZ                         | 1               | 08/30/18 16:34 |   |   |   |   |   |   |   |
| K1807189-006DUP                | 1               | 08/30/18 16:37 | X | X | X | X | X | X | X |
| K1807189-006DUP <del>TRP</del> | 1               | 08/30/18 16:39 | X | X | X | X | X | X | X |
| ZZZZZZ                         | 1               | 08/30/18 16:41 |   |   |   |   |   |   |   |
| ZZZZZZ                         | 1               | 08/30/18 16:44 |   |   |   |   |   |   |   |

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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807185

Analysis Run Log

Instrument ID: K-ICP-AES-04

Analytical BatchID: 604833

| Sample   | Dilution Factor | Date/Time      | A<br>l | C<br>a | F<br>e | M<br>g | K | N<br>a | S |
|----------|-----------------|----------------|--------|--------|--------|--------|---|--------|---|
| ZZZZZZ   | 1               | 08/30/18 16:46 |        |        |        |        |   |        |   |
| CCVB     | 1               | 08/30/18 16:48 | X      | X      | X      | X      | X | X      | X |
| CCVA     | 1               | 08/30/18 16:51 | X      | X      |        | X      |   |        |   |
| CCB      | 1               | 08/30/18 16:54 | X      | X      | X      | X      | X | X      | X |
| ZZZZZZ   | 1               | 08/30/18 16:57 |        |        |        |        |   |        |   |
| ZZZZZZ   | 1               | 08/30/18 16:59 |        |        |        |        |   |        |   |
| CCVB     | 1               | 08/30/18 17:01 | X      | X      | X      | X      | X | X      | X |
| CCVA     | 1               | 08/30/18 17:04 | X      | X      |        | X      |   |        |   |
| CCB      | 1               | 08/30/18 17:06 | X      | X      | X      | X      | X | X      | X |
| LLCCV    | 1               | 08/30/18 17:09 | X      | X      |        | X      |   | X      |   |
| ZZZZZZ   | 0.5             | 08/30/18 17:11 |        |        |        |        |   |        |   |
| LLCCV    | 0.5             | 08/30/18 17:14 |        |        |        |        | X |        | X |
| LLCCV 4X | 1               | 08/30/18 17:20 |        |        | X      |        |   |        |   |

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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807185

Analysis Run Log

Instrument ID: K-ICP-MS-06

Analytical BatchID: 604807

| Sample          | Dilution Factor | Date/Time      | S | A | B | B | C | C | C | P | M | N | A | T | U | V | Z |
|-----------------|-----------------|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|                 |                 |                | b | s | a | e | d | r | o | u | b | n | i | g | l |   | n |
| ZZZZZZ          | 1               | 08/30/18 17:19 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| ZZZZZZ          | 1               | 08/30/18 17:22 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| ICV             | 1               | 08/30/18 17:25 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CCV             | 1               | 08/30/18 17:29 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| ICB             | 1               | 08/30/18 17:32 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CCB             | 1               | 08/30/18 17:35 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| LLICVT          | 1               | 08/30/18 17:38 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| ICSA            | 1               | 08/30/18 17:41 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| ICSAB           | 1               | 08/30/18 17:44 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| ZZZZZZ          | 1               | 08/30/18 17:47 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| KQ1811997-01MB  | 5               | 08/30/18 17:50 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| KQ1811997-02LCS | 5               | 08/30/18 17:53 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| ZZZZZZ -03 SRM  | 5               | 08/30/18 17:57 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| ZZZZZZ -04 SRM  | 5               | 08/30/18 18:00 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| K1807185-006    | 5               | 08/30/18 18:03 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807185-006SDL | 25              | 08/30/18 18:06 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807185-006PS  | 5               | 08/30/18 18:09 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807185-006MS  | 5               | 08/30/18 18:12 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807185-006DMS | 5               | 08/30/18 18:16 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CCV             | 1               | 08/30/18 18:19 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CCB             | 1               | 08/30/18 18:22 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807185-012    | 5               | 08/30/18 18:25 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807185-018    | 5               | 08/30/18 18:28 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807185-024    | 5               | 08/30/18 18:31 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807185-030    | 5               | 08/30/18 18:34 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807185-036    | 5               | 08/30/18 18:37 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| ZZZZZZ          | 5               | 08/30/18 18:41 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| K1807189-006DUP | 5               | 08/30/18 18:44 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807189-006TRP | 5               | 08/30/18 18:47 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| ZZZZZZ          | 5               | 08/30/18 18:50 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| ZZZZZZ          | 5               | 08/30/18 18:53 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CCV             | 1               | 08/30/18 18:56 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CCB             | 1               | 08/30/18 18:59 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| ZZZZZZ          | 5               | 08/30/18 19:02 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| ZZZZZZ          | 5               | 08/30/18 19:06 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| ZZZZZZ          | 5               | 08/30/18 19:09 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CCV             | 1               | 08/30/18 19:12 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807185

Analysis Run Log

Instrument ID: K-ICP-MS-06

Analytical BatchID: 604807

| Sample | Dilution<br>Factor | Date/Time      | S | A | B | B | C | C | C | C | P | M | N | A | T | U | V | Z |
|--------|--------------------|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|        |                    |                | b | s | a | e | d | r | o | u | b | n | i | g | l |   |   | n |
| CCB    | 1                  | 08/30/18 19:15 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| LLCCVT | 1                  | 08/30/18 19:18 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807185

Analysis Run Log

Instrument ID: K-FLAA-02

Analytical BatchID: 605054

| Sample          | Dilution Factor | Date/Time      | Se |
|-----------------|-----------------|----------------|----|
| ZZZZZZ          | 1               | 08/31/18 11:04 |    |
| ZZZZZZ          | 1               | 08/31/18 11:06 |    |
| ZZZZZZ          | 1               | 08/31/18 11:09 |    |
| ZZZZZZ          | 1               | 08/31/18 11:11 |    |
| ZZZZZZ          | 1               | 08/31/18 11:13 |    |
| ZZZZZZ          | 1               | 08/31/18 11:16 |    |
| ZZZZZZ          | 1               | 08/31/18 11:18 |    |
| ICV             | 1               | 08/31/18 11:21 | X  |
| ICB             | 1               | 08/31/18 11:23 | X  |
| LLICV 0.2ppb    | 1               | 08/31/18 11:25 | X  |
| CCV             | 1               | 08/31/18 11:27 | X  |
| CCB             | 1               | 08/31/18 11:30 | X  |
| KQ1811997-01MB  | 5               | 08/31/18 11:32 | X  |
| KQ1811997-02LCS | 50              | 08/31/18 11:34 | X  |
| ZZZZZZ -03 SRA  | 10              | 08/31/18 11:37 |    |
| ZZZZZZ          | 10              | 08/31/18 11:39 |    |
| ZZZZZZ          | 50              | 08/31/18 11:41 |    |
| ZZZZZZ          | 50              | 08/31/18 11:44 |    |
| ZZZZZZ          | 5               | 08/31/18 11:46 |    |
| ZZZZZZ          | 5               | 08/31/18 11:48 |    |
| ZZZZZZ          | 50              | 08/31/18 11:51 |    |
| ZZZZZZ          | 50              | 08/31/18 11:53 |    |
| CCV             | 1               | 08/31/18 11:55 | X  |
| CCB             | 1               | 08/31/18 11:58 | X  |
| K1807185-006DMS | 50              | 08/31/18 12:00 | X  |
| ZZZZZZ          | 50              | 08/31/18 12:02 |    |
| K1807185-012    | 5               | 08/31/18 12:05 | X  |
| ZZZZZZ          | 5               | 08/31/18 12:07 |    |
| K1807185-018    | 5               | 08/31/18 12:09 | X  |
| ZZZZZZ          | 5               | 08/31/18 12:12 |    |
| K1807185-024    | 5               | 08/31/18 12:14 | X  |
| ZZZZZZ          | 5               | 08/31/18 12:16 |    |
| K1807185-030    | 5               | 08/31/18 12:19 | X  |
| ZZZZZZ          | 5               | 08/31/18 12:21 |    |
| CCV             | 1               | 08/31/18 12:23 | X  |
| CCB             | 1               | 08/31/18 12:26 | X  |
| K1807185-036    | 5               | 08/31/18 12:28 | X  |



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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807185

Analysis Run Log

Instrument ID: K-FLAA-02

Analytical BatchID: 605054

| Sample          | Dilution Factor | Date/Time      | S e |
|-----------------|-----------------|----------------|-----|
| ZZZZZZ          | 5               | 08/31/18 12:30 |     |
| ZZZZZZ          | 5               | 08/31/18 12:33 |     |
| ZZZZZZ          | 5               | 08/31/18 12:35 |     |
| K1807189-006DUP | 5               | 08/31/18 12:37 | X   |
| ZZZZZZ          | 5               | 08/31/18 12:39 |     |
| K1807189-006TRP | 5               | 08/31/18 12:42 | X   |
| ZZZZZZ          | 5               | 08/31/18 12:44 |     |
| ZZZZZZ          | 5               | 08/31/18 12:46 |     |
| ZZZZZZ          | 5               | 08/31/18 12:49 |     |
| CCV             | 1               | 08/31/18 12:51 | X   |
| CCB             | 1               | 08/31/18 12:53 | X   |
| ZZZZZZ          | 5               | 08/31/18 12:56 |     |
| ZZZZZZ          | 5               | 08/31/18 12:58 |     |
| ZZZZZZ          | 5               | 08/31/18 13:00 |     |
| ZZZZZZ          | 5               | 08/31/18 13:03 |     |
| ZZZZZZ          | 5               | 08/31/18 13:22 |     |
| ZZZZZZ          | 5               | 08/31/18 13:24 |     |
| ZZZZZZ          | 5               | 08/31/18 13:27 |     |
| ZZZZZZ          | 5               | 08/31/18 13:29 |     |
| ZZZZZZ -04 SRM  | 50              | 08/31/18 13:32 |     |
| ZZZZZZ          | 50              | 08/31/18 13:34 |     |
| CCV             | 1               | 08/31/18 13:36 | X   |
| CCB             | 1               | 08/31/18 13:38 | X   |
| K1807185-006MS  | 50              | 08/31/18 13:41 | X   |
| ZZZZZZ          | 50              | 08/31/18 13:43 |     |
| ZZZZZZ          | 50              | 08/31/18 13:45 |     |
| ZZZZZZ          | 50              | 08/31/18 13:48 |     |
| ZZZZZZ          | 5               | 08/31/18 13:51 |     |
| ZZZZZZ          | 5               | 08/31/18 13:54 |     |
| K1807185-006    | 5               | 08/31/18 13:56 | X   |
| ZZZZZZ          | 5               | 08/31/18 13:58 |     |
| CCV             | 1               | 08/31/18 14:01 | X   |
| CCB             | 1               | 08/31/18 14:03 | X   |

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807185

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument ID: K-ICP-MS-06

Analytical BatchID: 604807

| Sample          | Date/Time      | Li6NG | Sc45He | Ge72H2 | Ge72He | In115He | Lu175He | Th232He |
|-----------------|----------------|-------|--------|--------|--------|---------|---------|---------|
| ZZZZZZ          | 08/30/18 17:19 |       |        |        |        |         |         |         |
| ZZZZZZ          | 08/30/18 17:22 |       |        |        |        |         |         |         |
| ICV             | 08/30/18 17:25 | 95    | 94     | 97     | 99     | 98      | 99      | 100     |
| CCV             | 08/30/18 17:29 | 92    | 90     | 94     | 92     | 92      | 96      | 97      |
| ICB             | 08/30/18 17:32 | 91    | 95     | 96     | 100    | 98      | 101     | 102     |
| CCB             | 08/30/18 17:35 | 91    | 95     | 95     | 97     | 96      | 101     | 101     |
| LLICVT          | 08/30/18 17:38 | 91    | 92     | 92     | 97     | 96      | 99      | 100     |
| ICSA            | 08/30/18 17:41 | 82    | 87     | 90     | 95     | 89      | 97      | 97      |
| ICSAB           | 08/30/18 17:44 | 82    | 88     | 91     | 99     | 89      | 97      | 97      |
| ZZZZZZ          | 08/30/18 17:47 |       |        |        |        |         |         |         |
| KQ1811997-01MB  | 08/30/18 17:50 | 84    | 89     | 93     | 95     | 95      | 99      | 99      |
| KQ1811997-02LCS | 08/30/18 17:53 | 85    | 89     | 93     | 93     | 94      | 100     | 101     |
| KQ1811997-03SRM | 08/30/18 17:57 |       |        |        |        |         |         |         |
| KQ1811997-04SRM | 08/30/18 18:00 |       |        |        |        |         |         |         |
| K1807185-006    | 08/30/18 18:03 | 94    | 98     | 101    | 102    | 98      | 101     | 100     |
| K1807185-006SDL | 08/30/18 18:06 | 90    | 76     | 88     | 81     | 84      | 90      | 90      |
| K1807185-006PS  | 08/30/18 18:09 | 80    | 88     | 89     | 93     | 92      | 100     | 102     |
| K1807185-006MS  | 08/30/18 18:12 | 85    | 91     | 95     | 95     | 93      | 99      | 101     |
| K1807185-006DMS | 08/30/18 18:16 | 89    | 91     | 97     | 96     | 94      | 98      | 99      |
| CCV             | 08/30/18 18:19 | 95    | 95     | 99     | 98     | 97      | 99      | 99      |
| CCB             | 08/30/18 18:22 | 93    | 95     | 98     | 100    | 98      | 100     | 100     |
| K1807185-012    | 08/30/18 18:25 | 89    | 96     | 97     | 98     | 96      | 101     | 101     |
| K1807185-018    | 08/30/18 18:28 | 96    | 98     | 102    | 102    | 98      | 98      | 99      |
| K1807185-024    | 08/30/18 18:31 | 100   | 103    | 104    | 104    | 100     | 100     | 100     |
| K1807185-030    | 08/30/18 18:34 | 104   | 103    | 105    | 104    | 95      | 95      | 95      |
| K1807185-036    | 08/30/18 18:37 | 105   | 105    | 106    | 106    | 99      | 98      | 98      |
| ZZZZZZ          | 08/30/18 18:41 |       |        |        |        |         |         |         |
| K1807189-006DUP | 08/30/18 18:44 | 110   | 108    | 107    | 107    | 100     | 97      | 97      |
| K1807189-006DUP | 08/30/18 18:47 | 112   | 107    | 108    | 107    | 99      | 97      | 96      |
| ZZZZZZ          | 08/30/18 18:50 |       |        |        |        |         |         |         |
| ZZZZZZ          | 08/30/18 18:53 |       |        |        |        |         |         |         |
| CCV             | 08/30/18 18:56 | 114   | 108    | 110    | 109    | 100     | 98      | 98      |
| CCB             | 08/30/18 18:59 | 109   | 105    | 106    | 109    | 100     | 98      | 96      |
| ZZZZZZ          | 08/30/18 19:02 |       |        |        |        |         |         |         |
| ZZZZZZ          | 08/30/18 19:06 |       |        |        |        |         |         |         |
| ZZZZZZ          | 08/30/18 19:09 |       |        |        |        |         |         |         |
| CCV             | 08/30/18 19:12 | 113   | 106    | 108    | 107    | 99      | 97      | 95      |

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807185

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

**Instrument ID:** K-ICP-MS-06

**Analytical BatchID:** 604807

| Sample | Date/Time      | Li6NG | Sc45He | Ge72H2 | Ge72He | In115He | Lu175He | Th232He |
|--------|----------------|-------|--------|--------|--------|---------|---------|---------|
| CCB    | 08/30/18 19:15 | 108   | 103    | 106    | 106    | 99      | 97      | 96      |
| LLCCVT | 08/30/18 19:18 | 107   | 105    | 104    | 107    | 101     | 99      | 98      |

# US EPA Tune Check Report

Operator Name ALKLS NoUser  
 Acq/Data Batch D:\Agilent\ICPMH1\DATA\BatchTemplate\Experiments\083018.b  
 Acq. Date-Time 2018-08-30 12:22:44 PM  
 Report Comment —  
 Instrument Name G8421A JP16310358

[No Gas]

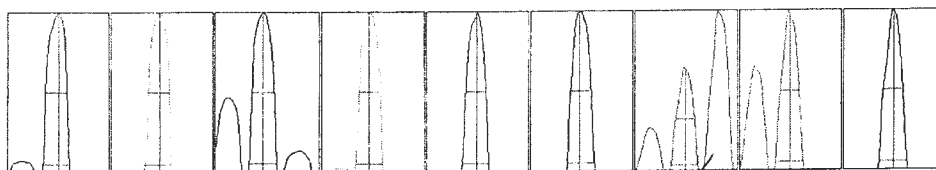
Sensitivity

| Mass | CPS       | RSD%  | RSD% (Required) | RSD% (Flag) |
|------|-----------|-------|-----------------|-------------|
| 7    | 124989.45 | 0.864 | 5.000           |             |
| 9    | 30959.83  | 0.550 | 5.000           |             |
| 24   | 87758.84  | 0.713 | 5.000           |             |
| 59   | 148801.99 | 0.700 | 5.000           |             |
| 115  | 259218.18 | 0.614 | 5.000           |             |
| 140  | 268285.51 | 0.564 | 5.000           |             |
| 208  | 152638.68 | 0.464 | 5.000           |             |
| 209  | 237315.50 | 1.098 | 5.000           |             |
| 238  | 291979.89 | 0.622 | 5.000           |             |

| Mass | Rep#1 Count | Rep#2 Count | Rep#3 Count | Rep#4 Count | Rep#5 Count |
|------|-------------|-------------|-------------|-------------|-------------|
| 7    | 12628       | 12518       | 12563       | 12353       | 12433       |
| 9    | 3116        | 3083        | 3097        | 3076        | 3108        |
| 24   | 8885        | 8764        | 8760        | 8734        | 8736        |
| 59   | 14996       | 14926       | 14836       | 14918       | 14724       |
| 115  | 26119       | 25988       | 25985       | 25738       | 25779       |
| 140  | 26941       | 26886       | 26952       | 26776       | 26588       |
| 208  | 15282       | 15376       | 15252       | 15195       | 15215       |
| 209  | 24089       | 23736       | 23868       | 23471       | 23493       |
| 238  | 29406       | 29174       | 29355       | 28975       | 29080       |

Integration Time [sec] 0.1

Resolution/Axis



| Mass | Peak Height | Axis  | Axis (Required) | Axis (Flag) | W-5%  | W-5% (Flag) | W-5% (Required) |
|------|-------------|-------|-----------------|-------------|-------|-------------|-----------------|
| 7    | 20724.63    | 7.05  | 6.90 - 7.10     |             | 0.782 |             | 0.900           |
| 9    | 5155.75     | 8.95  | 8.90 - 9.10     |             | 0.777 |             | 0.900           |
| 24   | 14206.22    | 23.90 | 23.90 - 24.10   |             | 0.786 |             | 0.900           |

# US EPA Tune Check Report

| Mass | Peak Height | Axis   | Axis (Required) | Axis (Flag) | W-5%  | W-5% (Flag) | W-5% (Required) |
|------|-------------|--------|-----------------|-------------|-------|-------------|-----------------|
| 59   | 24979.05    | 58.90  | 58.90 - 59.10   |             | 0.782 |             | 0.900           |
| 115  | 45988.66    | 115.00 | 114.90 - 115.10 |             | 0.775 |             | 0.900           |
| 140  | 47662.54    | 139.95 | 139.90 - 140.10 |             | 0.777 |             | 0.900           |
| 208  | 29030.71    | 208.00 | 207.90 - 208.10 |             | 0.780 |             | 0.900           |
| 209  | 44716.68    | 209.00 | 208.90 - 209.10 |             | 0.813 |             | 0.900           |
| 238  | 54753.89    | 238.00 | 237.90 - 238.10 |             | 0.821 |             | 0.900           |

Integration Time [sec] 0.1  
 Acquisition Time [sec] 268.4  
 Y Axis Linear

## Tune Parameters

### Plasma Parameters

|              |        |                |            |               |            |
|--------------|--------|----------------|------------|---------------|------------|
| Plasma Mode  | ---    | Nebulizer Gas  | 0.70 L/min | Dilution Gas  | 0.35 L/min |
| RF Power     | 1600 W | Option Gas     | ---        | Auxiliary Gas | 0.90 L/min |
| RF Matching  | 1.60 V | Nebulizer Pump | 0.10 rps   | Plasma Gas    | 15.0 L/min |
| Sample Depth | 8.0 mm | S/C Temp       | 2 °C       |               |            |

### Lens Parameters

|            |          |               |       |            |        |
|------------|----------|---------------|-------|------------|--------|
| Extract 1  | 0.0 V    | Omega Lens    | 8.0 V | Deflect    | 14.2 V |
| Extract 2  | -145.0 V | Cell Entrance | -30 V | Plate Bias | -55 V  |
| Omega Bias | -75 V    | Cell Exit     | -50 V |            |        |

### Cell Parameters

|         |            |              |        |                       |       |
|---------|------------|--------------|--------|-----------------------|-------|
| Use Gas | No         | 3rd Gas Flow | ---    | Energy Discrimination | 5.0 V |
| He Flow | 0.0 mL/min | OctP Bias    | -8.0 V |                       |       |
| H2 Flow | 0.0 mL/min | OctP RF      | 200 V  |                       |       |

### QP Parameters

|             |     |             |        |         |        |
|-------------|-----|-------------|--------|---------|--------|
| Mass Gain   | 127 | Axis Gain   | 1.0005 | QP Bias | -3.0 V |
| Mass Offset | 125 | Axis Offset | 0.00   |         |        |

## Hardware Settings

### Torch

|         |        |         |        |
|---------|--------|---------|--------|
| Torch H | 0.2 mm | Torch V | 0.7 mm |
|---------|--------|---------|--------|

### EM

|               |        |           |        |          |        |
|---------------|--------|-----------|--------|----------|--------|
| Discriminator | 4.2 mV | Analog HV | 2151 V | Pulse HV | 1174 V |
|---------------|--------|-----------|--------|----------|--------|

|       |       |        |       |       |          |     |
|-------|-------|--------|-------|-------|----------|-----|
| 2     | [8.0] | 0.210  | 0.836 | 0.213 | 11:18:04 | Yes |
| 3     | [8.0] | 0.208  | 0.865 | 0.210 | 11:18:38 | Yes |
| Mean: | [8.0] | 0.210  |       |       |          |     |
| SD:   | 0.0   | 0.0011 |       |       |          |     |
| %RSD: | 0.0   | 0.51   |       |       |          |     |

Standard number 6 applied. [8.0]

Correlation Coef.: 0.998986 Slope: 0.02672 Intercept: 0.00000

The calibration curve may not be linear.

\* Calibration data for Se 196.03 Equation: Linear Through Zero

| ID      | Mean Signal<br>(Abs) | Entered<br>Conc.<br>ug/L | Calculated<br>Conc.<br>ug/L | Standard<br>Deviation | %RSD |
|---------|----------------------|--------------------------|-----------------------------|-----------------------|------|
| Cal Blk | 0.0000               | 0                        | 0.000                       | 0.00                  | 16.7 |
| Std 0.2 | 0.0065 ✓             | 0.2                      | 0.243                       | 0.00                  | 4.7  |
| Std 0.5 | 0.0133 ✓             | 0.5                      | 0.498                       | 0.00                  | 2.0  |
| Std 1.0 | 0.0278 ✓             | 1.0                      | 1.041                       | 0.00                  | 0.9  |
| Std 2.5 | 0.0693 ✓             | 2.5                      | 2.594                       | 0.00                  | 1.8  |
| Std 4.0 | 0.1129 ✓             | 4.0                      | 4.226                       | 0.00                  | 0.8  |
| Std 8.0 | 0.2095 ✓             | 8.0                      | 7.840                       | 0.00                  | 0.5  |

Correlation Coef.: 0.998986 ✓ Slope: 0.02672 ✓ Intercept: 0.00000

Sequence No.: 8

Autosampler Location: 8

Sample ID: ICV

Date Collected: 8/31/2018 11:19:29 AM

Analyst:

Data Type: Original

## Replicate Data: ICV

| Repl  | SampleConc<br># ug/L | StdConc<br>ug/L | BlkCorr<br>Signal | Peak<br>Area | Peak<br>Height | Bkgnd<br>Area | Bkgnd<br>Height | Time     | Peak<br>Stored |
|-------|----------------------|-----------------|-------------------|--------------|----------------|---------------|-----------------|----------|----------------|
| 1     | 4.238                | 4.238           | 0.113             | 0.437        | 0.115          |               |                 | 11:19:54 | Yes            |
| 2     | 4.081                | 4.081           | 0.109             | 0.442        | 0.111          |               |                 | 11:20:28 | Yes            |
| 3     | 4.068                | 4.068           | 0.109             | 0.436        | 0.111          |               |                 | 11:21:01 | Yes            |
| Mean: | 4.129                | 4.129           | 0.110             |              |                |               |                 |          |                |
| SD:   | 0.095                | 0.095           | 0.0025            |              |                |               |                 |          |                |
| %RSD: | 2.299                | 2.299           | 2.30              |              |                |               |                 |          |                |

QC value within limits for Se 196.03 Recovery = 103.23%

All analyte(s) passed QC.

Sequence No.: 9

Autosampler Location: 1

Sample ID: ICB

Date Collected: 8/31/2018 11:21:53 AM

Analyst:

Data Type: Original

## Replicate Data: ICB

| Repl  | SampleConc<br># ug/L | StdConc<br>ug/L | BlkCorr<br>Signal | Peak<br>Area | Peak<br>Height | Bkgnd<br>Area | Bkgnd<br>Height | Time     | Peak<br>Stored |
|-------|----------------------|-----------------|-------------------|--------------|----------------|---------------|-----------------|----------|----------------|
| 1     | -0.011               | -0.011          | -0.000            | 0.005        | 0.002          |               |                 | 11:22:14 | Yes            |
| 2     | -0.027               | -0.027          | -0.001            | -0.006       | 0.001          |               |                 | 11:22:48 | Yes            |
| 3     | -0.028               | -0.028          | -0.001            | 0.002        | 0.001          |               |                 | 11:23:21 | Yes            |
| Mean: | -0.022               | -0.022          | -0.001            |              |                |               |                 |          |                |
| SD:   | 0.010                | 0.010           | 0.0003            |              |                |               |                 |          |                |
| %RSD: | 42.44                | 42.44           | 42.44             |              |                |               |                 |          |                |

QC value within limits for Se 196.03 Recovery = Not calculated

All analyte(s) passed QC.

Sequence No.: 10

Autosampler Location: 2

Sample ID: LLICV 0.2ppb

Date Collected: 8/31/2018 11:24:10 AM

Analyst:

Data Type: Original

## Replicate Data: LLICV 0.2ppb

| Repl | SampleConc | StdConc | BlkCorr | Peak | Peak | Bkgnd | Bkgnd | Time | Peak |
|------|------------|---------|---------|------|------|-------|-------|------|------|
|------|------------|---------|---------|------|------|-------|-------|------|------|

**ALS Environmental  
FAA Run Log**

|                                                                                    |                            |
|------------------------------------------------------------------------------------|----------------------------|
| <b>Method:</b> (Circle Method Used)<br>7742 7062<br>Other: _____<br>Element: As Se | <b>Service Request # :</b> |
|------------------------------------------------------------------------------------|----------------------------|

| SAMPLE<br>NUMBER  | Dilution<br>Factor | Measured<br>(µg/L) | Recoveries<br>(ICV, CCV, CRA, LCS,<br>Matrix Spk.)                                                                      |             | Comments<br><br>Post Spike = 2.5 ppb |
|-------------------|--------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------|-------------|--------------------------------------|
| Cal. Blk          | -                  | 0.000              |                                                                                                                         |             |                                      |
| Cal. Std 0.5      | -                  | 0.200              | *(0.010-50ml)                                                                                                           |             | *Cal. Std = AA1-24-H                 |
| Cal. Std 0.5      | -                  | 0.500              | *(0.025-50ml)                                                                                                           |             | *Cal. Std = AA1-24-H                 |
| Cal. Std 1.0      | -                  | 1.000              | *(0.05-50ml)                                                                                                            |             |                                      |
| Cal. Std 2.5      | -                  | 2.500              | *(0.125-50ml)                                                                                                           |             |                                      |
| Cal. Std 4.0      | -                  | 4.000              | *(0.200-50ml)                                                                                                           |             |                                      |
| Cal. Std 8.0      | -                  | 8.000              | *(0.400-50ml)                                                                                                           |             |                                      |
| ICV               | -                  | 4.129 ✓            | 103%                                                                                                                    |             | ICV Std = AA1-25-I                   |
| ICB               | -                  | -0.022             |                                                                                                                         |             |                                      |
| LLICV 0.2ppb      | -                  | 0.189 ✓            | 94%                                                                                                                     |             |                                      |
| CCV               | -                  | 4.221 ✓            | 106%                                                                                                                    |             |                                      |
| CCB               | -                  | -0.013             |                                                                                                                         |             |                                      |
| KQ1811997-01 5X   | 1/5                | 0.011              |                                                                                                                         |             |                                      |
| KQ1811997-02 50X  | 1/50               | 3.158 ✓            | 95%                                                                                                                     |             |                                      |
| KQ1811997-03 10X  | 1/10               | 0.382              |                                                                                                                         | Cx= 3.598 ✓ |                                      |
| KQ1811997-03A 10X | 1/10               | 0.648              | 106%                                                                                                                    |             | 10.6%                                |
| KQ1811997-04 50X  | 1/50               | 1.091              | <div style="font-size: 2em; transform: rotate(-45deg); display: inline-block;">           36<br/>8/31/18         </div> |             | See re-dilution                      |
| KQ1811997-04A 50X | 1/50               | 3.022              |                                                                                                                         |             | See re-dilution                      |
| K1807185-006 5X   | 1/5                | 2.257              |                                                                                                                         |             | See re-dilution                      |
| K1807185-006A 5X  | 1/5                | 3.015              |                                                                                                                         |             | See re-dilution                      |
| KQ1811997-05 50X  | 1/50               | 2.575              |                                                                                                                         |             | See re-dilution                      |
| KQ1811997-05A 50X | 1/50               | 4.924              |                                                                                                                         |             | See re-dilution                      |
| CCV               | -                  | 4.196              | 105%                                                                                                                    |             |                                      |
| CCB               | -                  | -0.014             |                                                                                                                         |             |                                      |
| KQ1811997-06 50X  | 1/50               | 2.139              | 73%                                                                                                                     | Cx= 3.148 ✓ |                                      |
| KQ1811997-06A 50X | 1/50               | 3.837              |                                                                                                                         |             | 67.9%                                |
| K1807185-012 5X   | 1/5                | 1.691              |                                                                                                                         | Cx= 2.891 ✓ |                                      |
| K1807185-012A 5X  | 1/5                | 3.153              |                                                                                                                         |             | 58.5%                                |
| K1807185-018 5X   | 1/5                | 2.344              |                                                                                                                         | Cx= 7.461 ✓ |                                      |
| K1807185-018A 5X  | 1/5                | 3.130              |                                                                                                                         |             | 31.4%                                |
|                   |                    |                    |                                                                                                                         |             |                                      |

|                                                  |                 |                 |                     |                 |
|--------------------------------------------------|-----------------|-----------------|---------------------|-----------------|
| <b>True Values/QC Limits:</b>                    | LCSW            | Water Spike     | LCSS (ERA D099-540) | Soil Spike      |
| Arsenic:                                         | 10ppb (80-120%) | 16ppb (75-125%) | 171mg/kg (113-209)  | 40ppb (75-125%) |
| Selenium                                         | 10ppb (80-120%) | 16ppb (75-125%) | 206mg/kg (131-252)  | 40ppb (75-125%) |
| Cx = MSA Corrected Concentration (as per method) |                 |                 |                     |                 |

|                                                                             |                                                                                  |                                                                 |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------|
| <b>Analyst</b><br><div style="font-size: 2em; text-align: center;">36</div> | <b>Date:</b><br><div style="font-size: 1.5em; text-align: center;">8/31/18</div> | <b>Page Number:</b><br><div style="text-align: center;">1</div> |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------|

**ALS Environmental  
FAA Run Log**

|                                                                              |                            |
|------------------------------------------------------------------------------|----------------------------|
| <b>Method:</b> (Circle Method Used)<br>7742 7062<br>Other:<br>Element: As Se | <b>Service Request # :</b> |
|------------------------------------------------------------------------------|----------------------------|

| SAMPLE<br>NUMBER  | Dilution<br>Factor | Measured<br>(µg/L) | Recoveries<br>(ICV, CCV, CRA, LCS,<br>Matrix Spk.) |             | Comments<br><br>Post Spike = 2.5 ppb |
|-------------------|--------------------|--------------------|----------------------------------------------------|-------------|--------------------------------------|
| K1807185-024 5X   | 1/5                | 1.830              |                                                    | Cx= 3.005 ✓ |                                      |
| K1807185-024A 5X  | 1/5                | 3.352              |                                                    |             | 60.9%                                |
| K1807185-030 5X   | 1/5                | 2.048              |                                                    | Cx= 4.029 ✓ |                                      |
| K1807185-030A 5X  | 1/5                | 3.319              |                                                    |             | 50.8%                                |
| CCV               | -                  | 4.141 ✓            | 104%                                               |             |                                      |
| CCB               | -                  | -0.012             |                                                    |             |                                      |
| K1807185-036 5X   | 1/5                | 2.099              |                                                    | Cx= 4.485 ✓ |                                      |
| K1807185-036A 5X  | 1/5                | 3.269              |                                                    |             | 46.8%                                |
| K1807189-006 5X   | 1/5                | 1.965              |                                                    | Cx= 6.845   |                                      |
| K1807189-006A 5X  | 1/5                | 2.683              |                                                    |             | 28.7%                                |
| KQ1811997-08 5X   | 1/5                | 1.928              |                                                    | Cx= 7.474   |                                      |
| KQ1811997-08A 5X  | 1/5                | 2.573              |                                                    |             | 25.8%                                |
| KQ1811997-09 5X   | 1/5                | 1.874              |                                                    | Cx= 6.774   |                                      |
| KQ1811997-09A 5X  | 1/5                | 2.566              |                                                    |             | 27.7%                                |
| K1807189-012 5X   | 1/5                | 1.835              |                                                    | Cx= 7.177   |                                      |
| K1807189-012A 5X  | 1/5                | 2.474              |                                                    |             | 25.6%                                |
| CCV               | -                  | 3.968 ✓            | 99%                                                |             |                                      |
| CCB               | -                  | -0.017             |                                                    |             |                                      |
| K1807189-018 5X   | 1/5                | 1.895              |                                                    | Cx= 6.115   |                                      |
| K1807189-018A 5X  | 1/5                | 2.670              |                                                    |             | 31.0%                                |
| K1807189-024 5X   | 1/5                | 2.374              |                                                    | Cx= 5.236   |                                      |
| K1807189-024A 5X  | 1/5                | 3.508              |                                                    |             | 45.3%                                |
| K1807189-030 5X   | 1/5                | 2.150              |                                                    | Cx= 5.508   |                                      |
| K1807189-030A 5X  | 1/5                | 3.126              |                                                    |             | 39.0%                                |
| K1807189-036 5X   | 1/5                | 2.111              |                                                    | Cx= 5.038   |                                      |
| K1807189-036A 5X  | 1/5                | 3.159              |                                                    |             | 41.9%                                |
| KQ1811997-04 50X  | 1/50               | 1.103              | 103%                                               | Cx= 2.226 ✓ |                                      |
| KQ1811997-04A 50X | 1/50               | 2.343              |                                                    |             | 49.6%                                |
| CCV               | -                  | 4.041 ✓            | 101%                                               |             |                                      |
| CCB               | -                  | -0.017             |                                                    |             |                                      |

|                                                  |                 |                 |                     |                 |
|--------------------------------------------------|-----------------|-----------------|---------------------|-----------------|
| <b>True Values/QC Limits:</b>                    | LCSW            | Water Spike     | LCSS (ERA D099-540) | Soil Spike      |
| Arsenic:                                         | 10ppb (80-120%) | 16ppb (75-125%) | 171mg/kg (113-209)  | 40ppb (75-125%) |
| Selenium                                         | 10ppb (80-120%) | 16ppb (75-125%) | 206mg/kg (131-252)  | 40ppb (75-125%) |
| Cx = MSA Corrected Concentration (as per method) |                 |                 |                     |                 |

|                                                                                 |                                                                                      |                                                                     |
|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| <b>Analyst</b><br><br><div style="font-size: 2em; text-align: center;">32</div> | <b>Date:</b><br><br><div style="font-size: 1.5em; text-align: center;">8/31/18</div> | <b>Page Number:</b><br><br><div style="text-align: center;">2</div> |
|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------|



## ALS Enviromental FAA Run Log

|                                                                                  |                           |
|----------------------------------------------------------------------------------|---------------------------|
| Method: (Circle Method Used)<br>742 7062<br>Other: _____<br>Element: As Se _____ | Service Request # : _____ |
|----------------------------------------------------------------------------------|---------------------------|

[illegible]

| True Values/QC Limits: | LCSW            | Water Spike     | LCSS (ERA D099-540) | Soil Spike      |
|------------------------|-----------------|-----------------|---------------------|-----------------|
| Arsenic:               | 10ppb (80-120%) | 16ppb (75-125%) | 171mg/kg (113-209)  | 40ppb (75-125%) |
| Selenium               | 10ppb (80-120%) | 16ppb (75-125%) | 206mg/kg (131-252)  | 40ppb (75-125%) |

Cx = MSA Corrected Concentration (as per method)

|         |         |              |
|---------|---------|--------------|
| Analyst | Date:   | Page Number: |
| 3c      | 8/31/11 | 3            |

## Preparation Information Benchsheet

**Prep Run:** 320955    **Prep Workflow:** MetDigTissMS    **Status:** Prepped    **Prep Date:** 08/29/2018 19:30 ✓  
**Team:** Metals    **Prep Method:** PSEP Metals    **Current Step:** Digestion    **Due Date:** 08/23/2018  
**Analyst:** CLUKKEN    **Rush/NPDES:** N/A    **Hold Date:** 01/21/2019

| Lab Code                      | Client ID                            | Sample # | Initial Amt | Target Residue | Final Volume | Spiked Amt                                        | Spiked Conc                                    | Spiked Vol      |
|-------------------------------|--------------------------------------|----------|-------------|----------------|--------------|---------------------------------------------------|------------------------------------------------|-----------------|
| KQ1811997-01                  | Method Blank                         |          | 0.300 g     |                | 30 mL        |                                                   |                                                |                 |
| KQ1811997-02                  | Lab Control Sample                   |          | 0.300 g     |                | 30 mL        | 0.3 mL<br>0.05 mL<br>0.3 mL<br>0.05 mL<br>0.05 mL | 191144<br>191777<br>191813<br>191959<br>191977 | 15% ULTREX HNO3 |
| KQ1811997-03                  | Standard Reference Material          |          | 0.302 g     |                | 30 mL        | 0.3 g                                             | 186748                                         | 15% ULTREX HNO3 |
| KQ1811997-04                  | Standard Reference Material          |          | 0.301 g     |                | 30 mL        | 0.3 g                                             | 189725                                         | 15% ULTREX HNO3 |
| K1807185-006                  | EPA-NP-A1                            | .02      | 0.300 g     | Freeze-Dried   | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807185-006:<br>KQ1811997-05 | Matrix Spike                         | .02      | 0.301 g     | Freeze-Dried   | 30 mL        | 0.3 mL<br>0.05 mL<br>0.3 mL<br>0.05 mL<br>0.05 mL | 191144<br>191777<br>191813<br>191959<br>191977 | 15% ULTREX HNO3 |
| K1807185-006:<br>KQ1811997-06 | Duplicate Matrix Spike               | .02      | 0.302 g     | Freeze-Dried   | 30 mL        | 0.3 mL<br>0.05 mL<br>0.3 mL<br>0.05 mL<br>0.05 mL | 191144<br>191777<br>191813<br>191959<br>191977 | 15% ULTREX HNO3 |
| K1807185-012                  | EPA-NP-A2                            | .02      | 0.301 g     | Freeze-Dried   | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807185-018                  | EPA-NP-A3                            | .02      | 0.301 g     | Freeze-Dried   | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807185-024                  | EPA-NP-A4                            | .02      | 0.302 g     | Freeze-Dried   | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807185-030                  | EPA-NP-A5                            | .02      | 0.301 g     | Freeze-Dried   | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807185-036                  | EPA-NP-A6                            | .02      | 0.301 g     | Freeze-Dried   | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807189-006                  | EPA-NP-B1                            | .02      | 0.302 g     | Freeze-Dried   | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807189-006:<br>KQ1811997-08 | Duplicate                            | .02      | 0.300 g     | Freeze-Dried   | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807189-006:<br>KQ1811997-09 | Duplicate<br><i>Triplicate Spike</i> | .02      | 0.301 g     | Freeze-Dried   | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807189-012                  | EPA-NP-B2                            | .02      | 0.300 g     | Freeze-Dried   | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807189-018                  | EPA-NP-B3                            | .02      | 0.300 g     | Freeze-Dried   | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807189-024                  | EPA-NP-B4                            | .02      | 0.301 g     | Freeze-Dried   | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807189-030                  | EPA-NP-B5                            | .02      | 0.301 g     | Freeze-Dried   | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807189-036                  | EPA-NP-B6                            | .02      | 0.301 g     | Freeze-Dried   | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |

20 Total Samples consisting of 12 Client Samples, 4 Client QC Samples, 4 Batch QC Samples associated with the current Prep Run.

**Spiking Solutions**

| Name         | Type  | ID     | Expires    | Name                | Type  | ID     | Expires    |
|--------------|-------|--------|------------|---------------------|-------|--------|------------|
| K-MET DORM-4 | Spike | 186748 | 12/28/2018 | K-MET SS5           | Spike | 191977 | 10/18/2018 |
| K-MET SS1    | Spike | 191813 | 9/14/2018  | K-MET TORT-3        | Spike | 189725 | 1/16/2019  |
| K-MET SS3    | Spike | 191777 | 2/27/2019  | Sulfur 1000 ug/mL S | Spike | 191144 | 12/31/2019 |
| K-MET SS4    | Spike | 191959 | 11/10/2018 |                     |       |        |            |

**Preparation Materials**

| Step      | Name                       | ID     | Step      | Name       | ID     |
|-----------|----------------------------|--------|-----------|------------|--------|
| Digestion | K-MET 50ml Centrifuge Tube | 191046 | Digestion | K-MET HNO3 | 192004 |

**Preparation Hardware / Equipment**

| Step      | Name             | Property                 | Value | Step      | Name               | Property | Value |
|-----------|------------------|--------------------------|-------|-----------|--------------------|----------|-------|
| Digestion | K-Metals-Oven-01 | Observed Temperature In  | 105   | Digestion | K-Tissue Pipette 2 |          |       |
| Digestion | K-Metals-Oven-01 | Observed Temperature Out | 105   |           |                    |          |       |

**Preparation Steps**

| Step      | Started         | Finished        | By      | Assisted By | Training? | Comments |
|-----------|-----------------|-----------------|---------|-------------|-----------|----------|
| Digestion | 29-AUG-18 19:30 | 30-AUG-18 10:25 | CLUKKEN |             | N         |          |

**Comments****Review**

Reviewed by:                      Date: 8/30/18

**ALS Group USA, Corp.**  
dba ALS Environmental  
Analytical Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish tissue

**Service Request:** K1807185  
**Date Collected:** 07/25-26/18  
**Date Received:** 07/28/18

Mercury, Total

Prep Method: METHOD  
Analysis Method: 1631E  
Test Notes:

Units: ng/g  
Basis: Dry

| Sample Name    | Lab Code     | MRL | MDL  | Dilution<br>Factor | Date<br>Extracted | Date<br>Analyzed | Result | Result<br>Notes |
|----------------|--------------|-----|------|--------------------|-------------------|------------------|--------|-----------------|
| EPA-NP-A1      | K1807185-006 | 5.0 | 0.45 | 5                  | 08/29/18 ✓        | 08/30/18 ✓       | 347 ✓  |                 |
| EPA-NP-A2      | K1807185-012 | 4.9 | 0.44 | 5                  | 08/29/18          | 08/30/18         | 294 ✓  |                 |
| EPA-NP-A3      | K1807185-018 | 4.9 | 0.44 | 5                  | 08/29/18          | 08/30/18         | 402 ✓  |                 |
| EPA-NP-A4      | K1807185-024 | 5.0 | 0.45 | 5                  | 08/29/18          | 08/30/18         | 345 ✓  |                 |
| EPA-NP-A5      | K1807185-030 | 5.0 | 0.45 | 5                  | 08/29/18          | 08/30/18         | 375 ✓  |                 |
| EPA-NP-A6      | K1807185-036 | 4.9 | 0.44 | 5                  | 08/29/18          | 08/30/18         | 425 ✓  |                 |
| Method Blank 1 | K1807185-MB1 | 1.0 | 0.09 | 1                  | 08/29/18          | 08/30/18         | ND     |                 |
| Method Blank 2 | K1807185-MB2 | 1.0 | 0.09 | 1                  | 08/29/18          | 08/30/18         | ND     |                 |
| Method Blank 3 | K1807185-MB3 | 1.0 | 0.09 | 1                  | 08/29/18          | 08/30/18         | 0.13   | J               |

no impact

**ALS Group USA, Corp.**  
**dba ALS Environmental**  
 QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish tissue

**Service Request:** K1807185  
**Date Collected:** 07/25/18  
**Date Received:** 07/28/18  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30/18

Matrix Spike/Duplicate Matrix Spike Summary  
 Total Metals

Sample Name: EPA-NP-A1 Units: ng/g  
 Lab Code: K1807185-006MS, ✓ K1807185-006DMS ✓ Basis: Dry  
 Test Notes:

| Analyte | Prep Method | Analysis Method | MRL | Spike Level |     | Sample Result | Percent Recovery |       |                       |      |        |     | Relative Percent Difference | Result Notes |
|---------|-------------|-----------------|-----|-------------|-----|---------------|------------------|-------|-----------------------|------|--------|-----|-----------------------------|--------------|
|         |             |                 |     |             |     |               | Spike Result     |       | ALS Acceptance Limits |      |        |     |                             |              |
|         |             |                 |     |             |     |               |                  |       | MS                    | DMS  | MS     | DMS |                             |              |
| Mercury | METHOD      | 1631E           | 5.0 | 249         | 249 | 347 ✓         | 622 ✓            | 568 ✓ | 110 ✓                 | 89 ✓ | 70-130 | 9 ✓ |                             |              |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish tissue

**Service Request:** K1807185  
**Date Collected:** 07/25/18  
**Date Received:** 07/28/18  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30/18

Triplicate Summary  
Metals

**Sample Name:** EPA-NP-A1  
**Lab Code:** K1807185-006TRP ✓  
**Test Notes:**

**Units:** ng/g  
**Basis:** Dry

| Analyte | Prep Method | Analysis Method | Sample Result | Duplicate Sample Result | Triplicate Sample Result | Average | Relative Standard Deviation | Result Notes |
|---------|-------------|-----------------|---------------|-------------------------|--------------------------|---------|-----------------------------|--------------|
| Mercury | METHOD      | 1631E           | 347 ✓         | 339 ✓                   | 365 ✓                    | 350     | 3.8 ✓                       |              |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**LCS Matrix:** Water

**Service Request:** K1807185  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/30/18

Ongoing Precision and Recovery (OPR) Sample Summary  
Total Metals

**Sample Name:** Ongoing Precision and Recovery (Initial)

**Units:** ng/g  
**Basis:** NA

**Test Notes:**

| Analyte | Prep<br>Method | Analysis<br>Method | True<br>Value | Result | Percent<br>Recovery | ALS<br>Percent<br>Recovery | Result<br>Notes |
|---------|----------------|--------------------|---------------|--------|---------------------|----------------------------|-----------------|
|         |                |                    |               |        |                     | Acceptance<br>Limits       |                 |
| Mercury | METHOD         | 1631E              | 5.00          | 5.50 ✓ | 110 ✓               | 70-130                     |                 |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**LCS Matrix:** Water

**Service Request:** K1807185  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/30/18

Ongoing Precision and Recovery (OPR) Sample Summary  
Total Metals

**Sample Name:** Ongoing Precision and Recovery (Final) **Units:** ng/g  
**Basis:** NA

**Test Notes:**

| Analyte | Prep<br>Method | Analysis<br>Method | True<br>Value | Result | Percent<br>Recovery | ALS<br>Percent<br>Recovery | Result<br>Notes |
|---------|----------------|--------------------|---------------|--------|---------------------|----------------------------|-----------------|
|         |                |                    |               |        |                     | Acceptance<br>Limits       |                 |
| Mercury | METHOD         | 1631E              | 5.00          | 5.40 ✓ | 108 ✓               | 70-130                     |                 |



ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-I39A  
**LCS Matrix:** Fish tissue

**Service Request:** K1807185  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30/18

Quality Control Sample (QCS) Summary  
Total Metals

**Sample Name:** Quality Control Sample  
**Lab Code:**  
**Test Notes:** Tort-3 Solids = 99.1%

**Units:** ng/g  
**Basis:** Dry

**Source:** TORT-3

| Analyte | Prep<br>Method | Analysis<br>Method | True<br>Value | Result | Percent<br>Recovery | ALS<br>Percent<br>Recovery<br>Acceptance<br>Limits | Result<br>Notes |
|---------|----------------|--------------------|---------------|--------|---------------------|----------------------------------------------------|-----------------|
|         |                |                    |               |        |                     |                                                    |                 |
| Mercury | METHOD         | 1631E              | 292           | 274 ✓  | 94 ✓                | 70-130                                             |                 |

## QA Summary Report

Batch Number:

Method Number: EPA 1631E

Project Number(s): TISSUES

Instrument ID: K-AFS-04

Date Analyzed: 8/30/18 ✓

Analyst Name: Anna Boyer

| Calibration        |          |                 |       |             |         |             |        |           |        |
|--------------------|----------|-----------------|-------|-------------|---------|-------------|--------|-----------|--------|
| QA Sample Type     | Name/ID  | Analyzed Result | Units | Spike Level | % REC ✓ | % REC Limit | RSD    | RSD Limit | Notes  |
| Calibration        | 12.5 pg  | 12.2            | pg    | 12.5        | 97.6    | 75-125      |        |           | accept |
|                    | 25 pg    | 26.6            | pg    | 25          | 106     | 75-125      |        |           | accept |
|                    | 100 pg   | 96.9            | pg    | 100         | 96.9    | 75-125      |        |           | accept |
|                    | 500 pg   | 515             | pg    | 500         | 103     | 75-125      |        |           | accept |
|                    | 2500 pg  | 2,390           | pg    | 2500        | 95.8    | 75-125      |        |           | accept |
|                    | 10000 pg | 10,100          | pg    | 10000       | 101     | 75-125      |        |           | accept |
| Calibration Factor |          | 0.000101 ✓      | pg/PA |             |         |             | 4.06 ✓ | < 15      | accept |
| Calibration Date   |          | 8/30/18 ✓       |       |             |         |             |        |           |        |

# QA Summary Report

Batch Number:

Method Number: EPA 1631E

Project Number(s): TISSUES

Instrument ID: K-AFS-04

Date Analyzed: 8/30/18

Analyst Name: Anna Boyer

| Blank Summary  |          |                 |       |          |        |             |        |
|----------------|----------|-----------------|-------|----------|--------|-------------|--------|
| QA Sample Type | Name/ID  | Analyzed Result | Units | Criteria | StDev  | StDev Limit | Notes  |
| CB             | CB-1     | 2.92            | pg    | < 50     |        |             | accept |
|                | CB-2     | 3.56            | pg    | < 50     |        |             | accept |
|                | CB-3     | 3.14            | pg    | < 50     |        |             | accept |
|                | CB-4     | 3.60            | pg    | < 50     |        |             | accept |
| Average        | 7A 32869 | 3.31            | pg    | < 25     | 0.332  | < 10        | accept |
| MBA            | MB-1     | 0.0382          | µg/Kg | <1.0     |        |             | accept |
|                | MB-2     | 0.0644          | µg/Kg | <1.0     |        |             | accept |
|                | MB-3     | 0.132 ✓         | µg/Kg | <1.0     |        |             | accept |
| Average        |          | 0.0782          | µg/Kg |          | 0.0484 |             |        |

QA Comments:

# QA Summary Report

Batch Number:

Method Number: EPA 1631E

Project Number(s): TISSUES

Instrument ID: K-AFS-04

Date Analyzed: 8/30/18

Analyst Name: Anna Boyer

| Bias and Precision |              |              |       |             |               |        |             |      |           |        |
|--------------------|--------------|--------------|-------|-------------|---------------|--------|-------------|------|-----------|--------|
| Type               | Name/ID      | Final Result | Units | Spike Level | Source Result | % REC  | % REC Limit | RPD  | RPD Limit | Notes  |
| MS                 | K1807185-006 | 622 ✓        | µg/Kg | 249         | 347           | 110.   | 70-130      |      |           | accept |
|                    | K1807189-006 | 597          | µg/Kg | 248         | 326           | 109    | 70-130      |      |           | accept |
| MSD                | K1807185-006 | 568 ✓        | µg/Kg | 249         | 347           | 88.8   | 70-130      | 9.08 | < 30      | accept |
|                    | K1807189-006 | 561          | µg/Kg | 250         | 326           | 94.0   | 70-130      | 6.17 | < 30      | accept |
| SRM                | TORT-3       | 274 ✓        | µg/Kg | 292         |               | 94.0 ✓ | 70-130      |      |           | accept |
| OPR                | OPR-1        | 5.50 ✓       | µg/Kg | 5.0         |               | 110. ✓ | 70-130      |      |           | accept |
|                    | OPR-2        | 5.40 ✓       | µg/Kg | 5.0         |               | 108 ✓  | 70-130      |      |           | accept |
| VER                | VER-1        | 5.08 ✓       | µg/Kg | 5.0         |               | 102 ✓  | 77-123      |      |           | accept |
|                    | VER-2        | 5.56 ✓       | µg/Kg | 5.0         |               | 111 ✓  | 77-123      |      |           | accept |
|                    | VER-3        | 4.84 ✓       | µg/Kg | 5.0         |               | 96.9 ✓ | 77-123      |      |           | accept |

# Run Report

Batch Number:

Method Number: EPA 1631E

Project Number(s): TISSUES

Instrument ID: K-AFS-04

Date Analyzed: 8/30/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID           | Method<br>Blank | Peak | Peak Area     | Analyzed Result<br>(pg) | Final Result<br>(µg/Kg) | QA Results | Criteria | Notes  |
|-----|------|------|-------------------|-----------------|------|---------------|-------------------------|-------------------------|------------|----------|--------|
| 1   | X    | CCB  | RINSE             |                 | 1    | 58,980        | 2.63                    |                         | 2.63       | < 50     | accept |
| 2   | Y    | CCB  | RINSE             |                 | 1    | 38,178        | 0.534                   |                         | 0.534      | < 50     | accept |
| 3   | X    | CB   | CB-1              |                 | 1    | 29,036 ✓      | 2.92                    |                         | 2.92       | < 50     | accept |
| 4   | Y    | CB   | CB-2              |                 | 1    | 35,436 ✓      | 3.56                    |                         | 3.56       | < 50     | accept |
| 5   | X    | CB   | CB-3              |                 | 1    | 31,206 ✓      | 3.14                    |                         | 3.14       | < 50     | accept |
| 6   | Y    | CB   | CB-4              |                 | 1    | 35,797 ✓      | 3.60                    |                         | 3.60       | < 50     | accept |
| 7   | X    | STD  | 12.5 pg           |                 | 1    | 154,122 ✓     | 12.2                    |                         | 97.6       | 75-125   | accept |
| 8   | Y    | STD  | 25 pg             |                 | 1    | 297,596 ✓     | 26.6                    |                         | 106        | 75-125   | accept |
| 9   | X    | STD  | 100 pg            |                 | 1    | 996,346 ✓     | 96.9                    |                         | 96.9       | 75-125   | accept |
| 10  | Y    | STD  | 500 pg            |                 | 1    | 5,149,118 ✓   | 515                     |                         | 103        | 75-125   | accept |
| 11  | X    | STD  | 2500 pg           |                 | 1    | 23,845,699 ✓  | 2,390                   |                         | 95.8       | 75-125   | accept |
| 12  | Y    | STD  | 10000 pg          |                 | 1    | 100,651,489 ✓ | 10,100                  |                         | 101        | 75-125   | accept |
| 13  | X    | VER  | VER-1             |                 | 1    | 1,296,711 ✓   | 127 ✓                   | 5.08 ✓                  | 102        | 77-123   | accept |
| 14  | Y    | OPR  | OPR-1             |                 | 1    | 2,769,656 ✓   | 275 ✓                   | 5.50 ✓                  | 110.       | 70-130   | accept |
| 15  | X    | MBA  | MB-1              |                 | 1    | 51,884 ✓      | 1.91 ✓                  | 0.0382 ✓                | 0.0382     | <1.0     | accept |
| 16  | Y    | MBA  | MB-2              |                 | 1    | 64,877 ✓      | 3.22 ✓                  | 0.0644 ✓                | 0.0644     | <1.0     | accept |
| 17  | X    | SRM  | TORT-3            |                 | 1    | 28,277,104 ✓  | 2,840 ✓                 | 274 ✓                   | 94.0       | 70-130   | accept |
| 18  | X    | S    | K1807185-006      |                 | 1    | 34,764,700 ✓  | 3,490 ✓                 | 347 ✓                   |            | < HS     | accept |
| 19  | Y    | MS   | K1807185-006      |                 | 1    | 62,168,528 ✓  | 6,250 ✓                 | 622 ✓                   | 110.       | 70-130   | accept |
| 20  | X    | MSD  | K1807185-006      |                 | 1    | 56,628,545 ✓  | 5,690 ✓                 | 568 ✓                   | 88.8       | 70-130   | accept |
| 21  | X    | S    | K1807185-006 DUP  |                 | 1    | 33,867,812 ✓  | 3,400 ✓                 | 339 ✓                   |            | < HS     | accept |
| 22  | Y    | S    | K1807185-006 TRIP |                 | 1    | 36,801,374 ✓  | 3,700 ✓                 | 365 ✓                   |            | < HS     | accept |
| 23  | X    | S    | K1807185-012      |                 | 1    | 29,588,829 ✓  | 2,970 ✓                 | 294 ✓                   |            | < HS     | accept |
| 24  | Y    | S    | K1807185-018      |                 | 1    | 41,003,824 ✓  | 4,120 ✓                 | 402 ✓                   |            | < HS     | accept |
| 25  | X    | S    | K1807185-024      |                 | 1    | 34,435,284 ✓  | 3,460 ✓                 | 345 ✓                   |            | < HS     | accept |
| 26  | Y    | S    | K1807185-030      |                 | 1    | 37,433,729 ✓  | 3,760 ✓                 | 375 ✓                   |            | < HS     | accept |
| 27  | X    | S    | K1807185-036      |                 | 1    | 43,437,859 ✓  | 4,370 ✓                 | 425 ✓                   |            | < HS     | accept |
| 28  | Y    | S    | K1807189-012      |                 | 1    | 49,703,281    | 5,000                   | 484                     |            | < HS     | accept |
| 29  | X    | S    | K1807189-018      |                 | 1    | 54,103,216    | 5,440                   | 528                     |            | < HS     | accept |
| 30  | Y    | S    | K1807189-024      |                 | 1    | 60,204,137    | 6,050                   | 604                     |            | < HS     | accept |
| 31  | X    | S    | K1807189-030      |                 | 1    | 41,422,013    | 4,160                   | 412                     |            | < HS     | accept |
| 32  | Y    | VER  | VER-2             |                 | 1    | 1,415,963 ✓   | 139 ✓                   | 5.56 ✓                  | 111        | 77-123   | accept |
| 33  | X    | S    | K1807189-006      |                 | 1    | 32,473,848    | 3,260                   | 326                     |            | < HS     | accept |

# Run Report

Batch Number:

Method Number: EPA 1631E

Project Number(s): TISSUES

Instrument ID: K-AFS-04

Date Analyzed: 8/30/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID      | Method<br>Blank | Peak | Peak Area   | Analyzed Result<br>(pg) | Final Result<br>(µg/Kg) | QA Results | Criteria | Notes  |
|-----|------|------|--------------|-----------------|------|-------------|-------------------------|-------------------------|------------|----------|--------|
| 34  | Y    | MS   | K1807189-006 |                 | 1    | 59,840,485  | 6,010                   | 597                     | 109        | 70-130   | accept |
| 35  | X    | MSD  | K1807189-006 |                 | 1    | 55,842,861  | 5,610                   | 561                     | 94.0       | 70-130   | accept |
| 36  | Y    | S    | K1807189-036 |                 | 1    | 97,775,800  | 9,830                   | 964                     |            | < HS     | accept |
| 37  | X    | MBA  | MB-3         |                 | 1    | 98,616      | 6.61 ✓                  | 0.132 ✓                 | 0.132      | <1.0     | accept |
| 38  | Y    | OPR  | OPR-2        |                 | 1    | 2,715,166 ✓ | 270. ✓                  | 5.40 ✓                  | 108        | 70-130   | accept |
| 39  | X    | VER  | VER-3        |                 | 1    | 1,237,193 ✓ | 121 ✓                   | 4.84 ✓                  | 96.9       | 77-123   | accept |

## Analyst Comments:

PMT: 521  
 OFFSET: 3,177  
 NOISE: 67  
 VOA Vial Lot # 8-039-001

$$(PA - 32869) (0.000101) \cdot \frac{V_D}{V_S \cdot V_A} = \mu g / Kg$$

# Run Information Report

Batch Number:

Method Number: EPA 1631E

Project Number(s): TISSUES

Instrument ID: K-AFS-04

Date Analyzed: 8/30/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID           | Method<br>Blank | Sample<br>Vol/Wt | Dilution<br>Vol (ml) | Analyzed<br>Vol (ml) | Expected<br>Value | Notes |
|-----|------|------|-------------------|-----------------|------------------|----------------------|----------------------|-------------------|-------|
| 1   | X    | CCB  | RINSE             |                 |                  |                      |                      |                   |       |
| 2   | Y    | CCB  | RINSE             |                 |                  |                      |                      |                   |       |
| 3   | X    | CB   | CB-1              |                 |                  |                      |                      |                   |       |
| 4   | Y    | CB   | CB-2              |                 |                  |                      |                      |                   |       |
| 5   | X    | CB   | CB-3              |                 |                  |                      |                      |                   |       |
| 6   | Y    | CB   | CB-4              |                 |                  |                      |                      |                   |       |
| 7   | X    | STD  | 12.5 pg           |                 |                  |                      |                      | 12.5              |       |
| 8   | Y    | STD  | 25 pg             |                 |                  |                      |                      | 25                |       |
| 9   | X    | STD  | 100 pg            |                 |                  |                      |                      | 100               |       |
| 10  | Y    | STD  | 500 pg            |                 |                  |                      |                      | 500               |       |
| 11  | X    | STD  | 2500 pg           |                 |                  |                      |                      | 2500              |       |
| 12  | Y    | STD  | 10000 pg          |                 |                  |                      |                      | 10000             |       |
| 13  | X    | VER  | VER-1             |                 | 25               | 25                   | 25                   | 5.0               |       |
| 14  | Y    | OPR  | OPR-1             |                 | 400              | 40                   | 5.0                  | 5.0               |       |
| 15  | X    | MBA  | MB-1              |                 | 400              | 40                   | 5.0                  |                   |       |
| 16  | Y    | MBA  | MB-2              |                 | 400              | 40                   | 5.0                  |                   |       |
| 17  | X    | SRM  | TORT-3            |                 | 414              | 40                   | 1.0                  | 292               |       |
| 18  | X    | S    | K1807185-006      |                 | 403              | 40                   | 1.0                  |                   |       |
| 19  | Y    | MS   | K1807185-006      |                 | 402              | 40                   | 1.0                  | 249               |       |
| 20  | X    | MSD  | K1807185-006      |                 | 401              | 40                   | 1.0                  | 249               |       |
| 21  | X    | S    | K1807185-006 DUP  |                 | 402              | 40                   | 1.0                  |                   |       |
| 22  | Y    | S    | K1807185-006 TRIP |                 | 405              | 40                   | 1.0                  |                   |       |
| 23  | X    | S    | K1807185-012      |                 | 405              | 40                   | 1.0                  |                   |       |
| 24  | Y    | S    | K1807185-018      |                 | 410              | 40                   | 1.0                  |                   |       |
| 25  | X    | S    | K1807185-024      |                 | 401              | 40                   | 1.0                  |                   |       |
| 26  | Y    | S    | K1807185-030      |                 | 401              | 40                   | 1.0                  |                   |       |
| 27  | X    | S    | K1807185-036      |                 | 411              | 40                   | 1.0                  |                   |       |
| 28  | Y    | S    | K1807189-012      |                 | 413              | 40                   | 1.0                  |                   |       |
| 29  | X    | S    | K1807189-018      |                 | 412              | 40                   | 1.0                  |                   |       |
| 30  | Y    | S    | K1807189-024      |                 | 401              | 40                   | 1.0                  |                   |       |
| 31  | X    | S    | K1807189-030      |                 | 404              | 40                   | 1.0                  |                   |       |
| 32  | Y    | VER  | VER-2             |                 | 25               | 25                   | 25                   | 5.0               |       |
| 33  | X    | S    | K1807189-006      |                 | 400              | 40                   | 1.0                  |                   |       |

## Run Information Report

Batch Number:

Method Number: EPA 1631E

Project Number(s): TISSUES

Instrument ID: K-AFS-04

Date Analyzed: 8/30/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID      | Method<br>Blank | Sample<br>Vol/Wt | Dilution<br>Vol (ml) | Analyzed<br>Vol (ml) | Expected<br>Value | Notes |
|-----|------|------|--------------|-----------------|------------------|----------------------|----------------------|-------------------|-------|
| 34  | Y    | MS   | K1807189-006 |                 | 403              | 40                   | 1.0                  | 248               |       |
| 35  | X    | MSD  | K1807189-006 |                 | 400              | 40                   | 1.0                  | 250               |       |
| 36  | Y    | S    | K1807189-036 |                 | 408              | 40                   | 1.0                  |                   |       |
| 37  | X    | MBA  | MB-3         |                 | 400              | 40                   | 5.0                  |                   |       |
| 38  | Y    | OPR  | OPR-2        |                 | 400              | 40                   | 5.0                  | 5.0               |       |
| 39  | X    | VER  | VER-3        |                 | 25               | 25                   | 25                   | 5.0               |       |



Standard MRL = 1.0  
Standard MDL = 0.09  
Standard Dilution = 1  
Standard Sample Mass = 0.400

|              |        |      |     |      |
|--------------|--------|------|-----|------|
| Method Blank | 0.4000 | 1.00 | 1.0 | 0.09 |
|--------------|--------|------|-----|------|

## Metals Digestion Sheet

| StarLims Number:   |          |     |                      | 320435             |                   |            |
|--------------------|----------|-----|----------------------|--------------------|-------------------|------------|
| Method : 1631EApp. |          |     | Analysis for : CVAFS |                    |                   |            |
| Sample             | Matrices | Dry | Wet                  | Initial Weight (g) | Final Volume (ml) | Matrix     |
| VER-1              | Water    |     | x                    | 25ml               | 25ml              | 0.5% BrCl  |
| VER-2              | Water    |     | x                    | 25ml               | 25ml              | 0.5% BrCl  |
| Method Blank       |          | x   |                      | 0.400              | 40                | 0.02N BrCl |
| Method Blank       |          | x   |                      | 0.400              | 40                | 0.02N BrCl |
| Method Blank       |          | x   |                      | 0.400              | 40                | 0.02N BrCl |
| OPR-1              |          | x   |                      | 0.400              | 40                | 0.02N BrCl |
| TORT-3             |          | x   |                      | 0.418              | 40                | 0.02N BrCl |
| K1807185-006       |          |     | x                    | 0.403              | 40                | 0.02N BrCl |
| K1807185-012       |          |     | x                    | 0.405              | 40                | 0.02N BrCl |
| K1807185-018       |          |     | x                    | 0.410              | 40                | 0.02N BrCl |
| K1807185-024       |          |     | x                    | 0.401              | 40                | 0.02N BrCl |
| K1807185-030       |          |     | x                    | 0.401              | 40                | 0.02N BrCl |
| K1807185-036       |          |     | x                    | 0.411              | 40                | 0.02N BrCl |
| K1807189-006       |          |     | x                    | 0.400              | 40                | 0.02N BrCl |
| K1807189-012       |          |     | x                    | 0.413              | 40                | 0.02N BrCl |
| K1807189-018       |          |     | x                    | 0.412              | 40                | 0.02N BrCl |
| K1807189-024       |          |     | x                    | 0.401              | 40                | 0.02N BrCl |
| K1807189-030       |          |     | x                    | 0.404              | 40                | 0.02N BrCl |
| K1807189-036       |          |     | x                    | 0.408              | 40                | 0.02N BrCl |
| K1807185-006S      |          |     | x                    | 0.402              | 40                | 0.02N BrCl |
| K1807185-006SD     |          |     | x                    | 0.401              | 40                | 0.02N BrCl |
| K1807189-006S      |          |     | x                    | 0.403              | 40                | 0.02N BrCl |
| K1807189-006SD     |          |     | x                    | 0.400              | 40                | 0.02N BrCl |
| K1807185-006D      |          |     | x                    | 0.402              | 40                | 0.02N BrCl |
| K1807185-006T      |          |     | x                    | 0.405              | 40                | 0.02N BrCl |
|                    |          |     | x                    |                    | 40                | 0.02N BrCl |
|                    |          |     | x                    |                    | 40                | 0.02N BrCl |
|                    |          |     | x                    |                    | 40                | 0.02N BrCl |
|                    |          |     | x                    |                    | 40                | 0.02N BrCl |
|                    |          |     | x                    |                    | 40                | 0.02N BrCl |
|                    |          |     | x                    |                    | 40                | 0.02N BrCl |
|                    |          |     | x                    |                    | 40                | 0.02N BrCl |
| OPR-2              |          | x   |                      | 0.400              | 40                | 0.02N BrCl |
| VER-3              | Water    |     | x                    | 25ml               | 25ml              | 0.5% BrCl  |

VOA Vial Lot # 8-039-001

BrCl = AF2-38-F

AF2-38-I (40ppb)  
AF2-38-D (2.5ppb)OPR: 0.05mL  
QCS: 0.8mL

Digestion Acid Mixture: AF2-38-G

1st MS / DMS: 1.0.1mL QCS Parent 1ppm AF2-27-D Balance ID: 37  
2nd MS / DMS: 

Comments: TORT-3 Solids: 99.1%

HotBlock: K-Block Digester: 16 Observed Temp: 104°C Correction factor: 0 Corrected Temp: 104°C

Time Digestion Started: 10:30am Dilution Completed: 4:00pm

|                    |                          |
|--------------------|--------------------------|
| Analyst Anna Bayer | Date 3/22/18 3/29/18     |
|                    | weighed weighed/digested |

1631Dig.XLS  
06/17/04

**ALS Group USA, Corp.**  
dba ALS Environmental  
Analytical Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish tissue

**Service Request:** K1807185  
**Date Collected:** 07/25-26/18  
**Date Received:** 07/28/18

Total Inorganic Arsenic

Prep Method: Method  
Analysis Method: 1632A  
Test Notes:

Units: ug/g  
Basis: Dry

| Sample Name    | Lab Code     | MRL  | MDL   | Dilution<br>Factor | Date<br>Extracted | Date<br>Analyzed | Result | Result<br>Notes |
|----------------|--------------|------|-------|--------------------|-------------------|------------------|--------|-----------------|
| EPA-NP-A1      | K1807185-006 | 0.02 | 0.007 | 1                  | 08/29/18 ✓        | 08/30/18 ✓       | ND     |                 |
| EPA-NP-A2      | K1807185-012 | 0.02 | 0.007 | 1                  | 08/29/18          | 08/30/18         | ND     | ✓               |
| EPA-NP-A3      | K1807185-018 | 0.02 | 0.007 | 1                  | 08/29/18          | 08/30/18         | ND     | ✓               |
| EPA-NP-A4      | K1807185-024 | 0.02 | 0.007 | 1                  | 08/29/18          | 08/30/18         | ND     |                 |
| EPA-NP-A5      | K1807185-030 | 0.02 | 0.007 | 1                  | 08/29/18          | 08/30/18         | ND     |                 |
| EPA-NP-A6      | K1807185-036 | 0.02 | 0.007 | 1                  | 08/29/18          | 08/30/18         | ND     |                 |
| Method Blank 1 | K1807185-MB1 | 0.02 | 0.007 | 1                  | 08/29/18          | 08/30/18         | ND     |                 |
| Method Blank 2 | K1807185-MB2 | 0.02 | 0.007 | 1                  | 08/29/18          | 08/30/18         | ND     |                 |
| Method Blank 3 | K1807185-MB3 | 0.02 | 0.007 | 1                  | 08/29/18          | 08/30/18         | ND     |                 |

**ALS Group USA, Corp.**  
**dba ALS Environmental**  
 QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish tissue

**Service Request:** K1807185  
**Date Collected:** 07/25/18  
**Date Received:** 07/28/18  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30/18

Total Metals  
 Matrix Spike/Duplicate Matrix Spike Summary

**Sample Name:** EPA-NP-A1  
**Lab Code:** K1807185-006MS, ✓ K1807185-006DMS ✓  
**Test Notes:**

**Units:** ug/g  
**Basis:** Dry

| Analyte           | Prep<br>Method | Analysis<br>Method | MRL   | Spike Level |       | Sample<br>Result | Spike Result |       | Percent Recovery |     | Method<br>Acceptance<br>Limits | Relative<br>Percent<br>Difference | Result<br>Notes |
|-------------------|----------------|--------------------|-------|-------------|-------|------------------|--------------|-------|------------------|-----|--------------------------------|-----------------------------------|-----------------|
|                   |                |                    |       |             |       |                  |              |       | MS               | DMS |                                |                                   |                 |
|                   |                |                    |       | MS          | DMS   |                  | MS           | DMS   | MS               | DMS |                                |                                   |                 |
| Inorganic Arsenic | Method         | 1632A              | 0.080 | 0.586       | 0.598 | ND ✓             | 0.256 ✓      | 0.281 | 44               | 47  | 50-150                         | 9 ✓                               | N               |

✓ J all

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish tissue

**Service Request:** K1807185  
**Date Collected:** 07/26/18  
**Date Received:** 07/28/18  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30/18

Triplicate Summary  
Metals

Sample Name: EPA-NP-A6  
Lab Code: K1807185-036TRP ✓  
Test Notes:

Units: ug/g  
Basis: Dry

| Analyte | Prep Method | Analysis Method | Sample Result | Duplicate Sample Result | Triplicate Sample Result | Average | Relative Standard Deviation | Result Notes |
|---------|-------------|-----------------|---------------|-------------------------|--------------------------|---------|-----------------------------|--------------|
| Arsenic | METHOD      | 1632            | ND U          | 0.007 J ✓               | ND U                     | NC      | NC                          |              |

**ALS Group USA, Corp.**  
 dba ALS Environmental  
 QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**LCS Matrix:** Water

**Service Request:** K1807185  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30/18

Ongoing Precision and Recovery (OPR) Sample Summary  
 Total Metals

**Sample Name:** Ongoing Precision and Recovery

**Units:** ug/g  
**Basis:** NA

| Analyte           | Prep Method | Analysis Method | True Value | Result  | Percent Recovery | ALS Percent Recovery Acceptance Limits | Result Notes |
|-------------------|-------------|-----------------|------------|---------|------------------|----------------------------------------|--------------|
|                   |             |                 |            |         |                  |                                        |              |
| Inorganic Arsenic | Method      | 1632A           | 0.200      | 0.210 ✓ | 105 ✓            | 50-150                                 |              |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**LCS Matrix:** Water

**Service Request:** K1807185  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/30/18

Calibration Verification (CALVER) Sample Summary  
Total Metals

Sample Name: CALVER 1

Units: ug/L  
Basis: NA

Test Notes:

| Analyte           | Prep Method | Analysis Method | True Value | Result  | Percent Recovery | ALS                                | Result Notes |
|-------------------|-------------|-----------------|------------|---------|------------------|------------------------------------|--------------|
|                   |             |                 |            |         |                  | Percent Recovery Acceptance Limits |              |
| Inorganic Arsenic | NA          | 1632A           | 0.20       | 0.192 ✓ | 96 ✓             | 80-120                             |              |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**LCS Matrix:** Water

**Service Request:** K1807185  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/30/18

Calibration Verification (CALVER) Sample Summary  
Total Metals

Sample Name: CALVER 2

Units: ug/L  
Basis: NA

Test Notes:

| Analyte           | Prep Method | Analysis Method | True Value | Result | ALS Percent Recovery |    | Acceptance Limits | Result Notes |
|-------------------|-------------|-----------------|------------|--------|----------------------|----|-------------------|--------------|
|                   |             |                 |            |        | Percent Recovery     |    |                   |              |
| Inorganic Arsenic | NA          | 1632A           | 0.20       | 0.194  | ✓                    | 97 | ✓                 | 80-120       |



ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-I39A  
**LCS Matrix:** Water

**Service Request:** K1807185  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/30/18

Calibration Verification (CALVER) Sample Summary  
Total Metals

Sample Name: CALVER 3

Units: ug/L  
Basis: NA

Test Notes:

| Analyte           | Prep Method | Analysis Method | True Value | Result  | Percent Recovery | ALS                                | Result Notes |
|-------------------|-------------|-----------------|------------|---------|------------------|------------------------------------|--------------|
|                   |             |                 |            |         |                  | Percent Recovery Acceptance Limits |              |
| Inorganic Arsenic | NA          | 1632A           | 0.20       | 0.189 ✓ | 94 ✓             | 80-120                             |              |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**LCS Matrix:** Water

**Service Request:** K1807185  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/30/18

Calibration Verification (CALVER) Sample Summary  
Total Metals

Sample Name: CALVER 4

Units: ug/L  
Basis: NA

Test Notes:

| Analyte           | Prep Method | Analysis Method | True Value | Result  | Percent Recovery | ALS                                | Result Notes |
|-------------------|-------------|-----------------|------------|---------|------------------|------------------------------------|--------------|
|                   |             |                 |            |         |                  | Percent Recovery Acceptance Limits |              |
| Inorganic Arsenic | NA          | 1632A           | 0.20       | 0.182 ✓ | 91 ✓             | 80-120                             |              |

|                                                                          |                                                                      |
|--------------------------------------------------------------------------|----------------------------------------------------------------------|
| Method 1632: (circle species)<br>(TIA) AsIII MMA DMA<br>Analysis For: As | Service Request # : K1807557, K1807598, K1807987, K1807185, K1807189 |
|--------------------------------------------------------------------------|----------------------------------------------------------------------|

| DATA |                 |                    |                    |                     |                 |           |        |                 |              |
|------|-----------------|--------------------|--------------------|---------------------|-----------------|-----------|--------|-----------------|--------------|
| Pos. | SAMPLE NUMBER   | Initial Sample (g) | Digest Volume (mL) | Aliquot Volume (mL) | Dilution Factor | peak area | net ng | net ng/L / ng/g | Comments     |
| 1    | CALBLK 0        | ~                  | ~                  | 50                  | ~               | 41.8680   | 0.00   | 0.0             |              |
| 2    | 0.5 ng wk std A | ~                  | ~                  | 50                  | ~               | 69.5070   | 0.54   | 10.8            |              |
| 3    | 10 ng wk std A  | ~                  | ~                  | 50                  | ~               | 546.7110  | 9.82   | 196.4           |              |
| 4    | 20 ng wk std A  | ~                  | ~                  | 50                  | ~               | 1031.6350 | 19.25  | 385.0           |              |
| 5    | 30 ng wk std A  | ~                  | ~                  | 50                  | ~               | 1553.9160 | 29.41  | 588.2           |              |
| 6    | CALBLK 1        | ~                  | ~                  | 50                  | ~               | 34.4310   | -0.14  | -2.9            |              |
| 7    | CALVER 1        | ~                  | ~                  | 50                  | ~               | 535.1950  | 9.60   | 191.9           | CALVER : 96% |
| 8    | CALBLK 2        | ~                  | ~                  | 50                  | ~               | 60.1020   | 0.35   | 7.1             |              |
| 9    | OPR             | 0.500              | 10                 | 2.0                 | ~               | 1122.7810 | 21.02  | 210.2           | OPR : 105%   |
| 10   | MB1             | 0.500              | 10                 | 2.0                 | ~               | 71.5950   | 0.58   | 5.8             |              |
| 11   | MB2             | 0.500              | 10                 | 2.0                 | ~               | 30.0640   | -0.23  | -2.3            |              |
| 12   | MB3             | 0.500              | 10                 | 2.0                 | ~               | 34.9130   | -0.14  | -1.4            |              |
| 13   | K1807598-001    | 0.505              | 10                 | 2.0                 | ~               | 104.5110  | 1.22   | 12.1            |              |
| 14   | K1807598-001S   | 0.504              | 10                 | 0.5                 | 4               | 812.8010  | 14.99  | 595.0           | MS : 98%     |
| 15   | K1807598-001SD  | 0.508              | 10                 | 0.5                 | 4               | 807.2560  | 14.89  | 586.1           | MSD : 97%    |
| 16   | K1807557-001    | 0.500              | 10                 | 2.0                 | ~               | 44.8370   | 0.06   | 0.6             |              |
| 17   | K1807557-001S   | 0.519              | 10                 | 0.5                 | 4               | 667.1885  | 12.16  | 468.7           | MS : 81%     |
| 18   | K1807557-001SD  | 0.504              | 10                 | 0.5                 | 4               | 723.7345  | 13.26  | 526.3           | MSD : 88%    |
| 19   | CALVER 2        | ~                  | ~                  | 50                  | ~               | 539.4440  | 9.68   | 193.6           | CALVER : 97% |
| 20   | CALBLK 3        | ~                  | ~                  | 50                  | ~               | 54.3765   | 0.24   | 4.9             |              |
| 21   | K1807987-001    | 1.643              | 30                 | 2.0                 | ~               | 49.0590   | 0.14   | 1.3             |              |
| 22   | K1807185-006    | 0.507              | 10                 | 2.0                 | ~               | 38.8090   | -0.06  | -0.6            |              |
| 23   | K1807185-006S   | 0.512              | 10                 | 0.5                 | 4               | 378.5605  | 6.55   | 255.8           | MS : 44%     |
| 24   | K1807185-006SD  | 0.502              | 10                 | 0.5                 | 4               | 404.1350  | 7.05   | 280.7           | MSD : 47%    |
| 25   | K1807189-006    | 0.512              | 10                 | 2.0                 | ~               | 40.0360   | -0.04  | -0.3            |              |

|           |                          |                 |     |           |             |          |
|-----------|--------------------------|-----------------|-----|-----------|-------------|----------|
| Comments: | wk std A : AA1-39-C      | Calibration:    |     | net       | Calibration |          |
|           | wk std B : AA1-39-F      |                 | ng  | peak area | Factor      |          |
|           | KBH4 : HG-AAS-3-I        |                 | 30  | 1512.0480 | 50.4016     |          |
|           | 4.8M HCl : HG-AAS-5-D    |                 | 20  | 989.7670  | 49.4884     |          |
|           | Tris-Buffer : HG-AAS-5-B |                 | 10  | 504.8430  | 50.4843     |          |
|           | K7598-001S=595           | K7598-001SD=591 | 0.5 | 27.6390   | 55.2780     |          |
|           | K7557-001S=578           | K7557-001SD=595 |     |           | 51.4131     | CF mean  |
|           | K7175-006S=586           | K7175-006SD=598 |     |           | 2.62        | CF Stdev |
|           | CALVER/MS/MSD :          |                 |     |           | 5.09        | RSD      |

|                              |                  |                        |
|------------------------------|------------------|------------------------|
| Analyst:<br>Elmaberto McALAN | Date:<br>8/30/18 | Page Number:<br>1 of 2 |
|------------------------------|------------------|------------------------|

TIAS AsIII MMA DMA

Service Request # : K1807557, K1807598, K1807987, K1807185, K1807189

## DATA

[illegible]

|              |                          |                |  |                 |  |
|--------------|--------------------------|----------------|--|-----------------|--|
| Calibration: | wk std A : AA1-39-C      |                |  |                 |  |
|              | wk std B : AA1-39-F      |                |  |                 |  |
|              | KBH4 : HG-AAS-3-I        | K7189-006S=592 |  | K7189-006SD=598 |  |
|              | 4.8M HCl : HG-AAS-5-D    |                |  |                 |  |
|              | Tris-Buffer : HG-AAS-5-B |                |  |                 |  |
|              |                          |                |  |                 |  |
|              |                          |                |  |                 |  |
|              |                          |                |  |                 |  |
|              | CALVER/MS/MSD :          |                |  |                 |  |

**Analyst:**

Date:

Page Number:

**Tissue Dry Wt. MRL and MDL Calculations:**

Standard MRL = 0.02  
 Standard MDL = 0.007  
 Standard Dilution = 1  
 Standard Sample Mass = 0.500

| Sample I.D.    | Dry<br>Weight ✓ | Dilution | Weight & Dilution Adjusted |       |
|----------------|-----------------|----------|----------------------------|-------|
|                |                 |          | MRL                        | MDL   |
| K1807557-001   | 0.5000          | 1        | 0.020                      | 0.007 |
| K1807557-001S  | 0.5190          | 4        | 0.077                      | 0.027 |
| K1807557-001SD | 0.5040          | 4        | 0.079                      | 0.028 |
| K1807987-001   | 1.6430          | 1        | 0.006                      | 0.002 |
| K1807598-001   | 0.5050          | 1        | 0.020                      | 0.007 |
| K1807598-001S  | 0.5040          | 4        | 0.079                      | 0.028 |
| K1807598-001SD | 0.5080          | 4        | 0.079                      | 0.028 |
| K1807185-006   | 0.5070          | 1        | 0.020                      | 0.007 |
| K1807185-006S  | 0.5120          | 4        | 0.078                      | 0.027 |
| K1807185-006SD | 0.5020          | 4        | 0.080                      | 0.028 |
| K1807185-012   | 0.5010          | 1        | 0.020                      | 0.007 |
| K1807185-018   | 0.5060          | 1        | 0.020                      | 0.007 |
| K1807185-024   | 0.5020          | 1        | 0.020                      | 0.007 |
| K1807185-030   | 0.5050          | 1        | 0.020                      | 0.007 |
| K1807185-036   | 0.5050          | 1        | 0.020                      | 0.007 |
| K1807185-036D  | 0.5040          | 1        | 0.020                      | 0.007 |
| K1807185-036T  | 0.5020          | 1        | 0.020                      | 0.007 |
| K1807189-006   | 0.5120          | 1        | 0.020                      | 0.007 |
| K1807189-006S  | 0.5070          | 4        | 0.079                      | 0.028 |
| K1807189-006SD | 0.5020          | 4        | 0.080                      | 0.028 |
| K1807189-012   | 0.5130          | 1        | 0.019                      | 0.007 |
| K1807189-018   | 0.5010          | 1        | 0.020                      | 0.007 |
| K1807189-024   | 0.5060          | 1        | 0.020                      | 0.007 |
| K1807189-030   | 0.5130          | 1        | 0.019                      | 0.007 |
| K1807189-036   | 0.5130          | 1        | 0.019                      | 0.007 |
| Method Blank   | 0.5000          | 1        | 0.020                      | 0.007 |

|                                                                             |                                   |
|-----------------------------------------------------------------------------|-----------------------------------|
| Service Request Number(s): K1807557, K1807598, K1807987, K1807185, K1807189 | Prep. Run Number: 321043 / 321044 |
| Analysis for: Tissue Extraction for TIAs                                    |                                   |

**DATA**

| SR #           | Sample ID | Freeze Dried Sample (g) | Extraction Sol'n | Amount of Extraction Sol'n (mL) |
|----------------|-----------|-------------------------|------------------|---------------------------------|
| OPR            |           | 0.500                   | 2M HCl           | 10                              |
| MB1            |           | 0.500                   | 2M HCl           | 10                              |
| MB2            |           | 0.500                   | 2M HCl           | 10                              |
| MB3            |           | 0.500                   | 2M HCl           | 10                              |
| K1807557-001   |           | 0.500                   | 2M HCl           | 10                              |
| K1807557-001S  |           | 0.519                   | 2M HCl           | 10                              |
| K1807557-001SD |           | 0.504                   | 2M HCl           | 10                              |
| K1807987-001   |           | 1.643                   | 2M HCl           | 30 <del>10</del> (see 3/27/18)  |
| K1807598-001   |           | 0.505                   | 2M HCl           | 10                              |
| K1807598-001S  |           | 0.504                   | 2M HCl           | 10                              |
| K1807598-001SD |           | 0.508                   | 2M HCl           | 10                              |
| K1807185-006   |           | 0.507                   | 2M HCl           | 10                              |
| K1807185-006S  |           | 0.512                   | 2M HCl           | 10                              |
| K1807185-006SD |           | 0.502                   | 2M HCl           | 10                              |
| K1807185-012   |           | 0.501                   | 2M HCl           | 10                              |
| K1807185-018   |           | 0.506                   | 2M HCl           | 10                              |
| K1807185-024   |           | 0.502                   | 2M HCl           | 10                              |
| K1807185-030   |           | 0.505                   | 2M HCl           | 10                              |
| K1807185-036   |           | 0.505                   | 2M HCl           | 10                              |
| K1807189-006   |           | 0.512                   | 2M HCl           | 10                              |
| K1807189-006S  |           | 0.507                   | 2M HCl           | 10                              |
| K1807189-006SD |           | 0.502                   | 2M HCl           | 10                              |
| K1807189-012   |           | 0.513                   | 2M HCl           | 10                              |
| K1807189-018   |           | 0.501                   | 2M HCl           | 10                              |
| K1807189-024   |           | 0.506                   | 2M HCl           | 10                              |
| K1807189-030   |           | 0.513                   | 2M HCl           | 10                              |
| K1807189-036   |           | 0.513                   | 2M HCl           | 10                              |
| K1807185-036D  |           | 0.504                   |                  |                                 |
|                |           | 0.502                   |                  |                                 |

2M HCl Lot #: HG-AAS-26-I

MS/MSD: 0.15mL AA1-39-G

OPR: 0.05mL AA1-39-G

Comments: K-B21-37

Analyst: Elmabert mawla 8/29/18

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish Tissue  
**Analysis Method:** Calculation  
**Prep Method:** None

**Service Request:** K1807185  
**Date Collected:** 07/25/18 - 07/26/18  
**Date Received:** 07/28/18  
**Units:** Percent  
**Basis:** Wet

Moisture

| Sample Name | Lab Code     | Result | MRL | MDL | Dil. | Date Analyzed    | Q |
|-------------|--------------|--------|-----|-----|------|------------------|---|
| EPA-NP-A1   | K1807185-006 | 79.8 ✓ | -   | -   | 1    | 08/20/18 16:26 ✓ |   |
| EPA-NP-A2   | K1807185-012 | 80.5 ✓ | -   | -   | 1    | 08/20/18 16:26   |   |
| EPA-NP-A3   | K1807185-018 | 79.4 ✓ | -   | -   | 1    | 08/20/18 16:26   |   |
| EPA-NP-A4   | K1807185-024 | 79.4 ✓ | -   | -   | 1    | 08/20/18 16:26   |   |
| EPA-NP-A5   | K1807185-030 | 79.9 ✓ | -   | -   | 1    | 08/20/18 16:26   |   |
| EPA-NP-A6   | K1807185-036 | 79.6 ✓ | -   | -   | 1    | 08/20/18 16:26   |   |

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** Teck American Incorporated  
**Project** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish Tissue

**Service Request:** K1807185  
**Date Collected:** 07/25/18  
**Date Received:** 07/28/18  
**Date Analyzed:** 08/20/18

Replicate Sample Summary  
Inorganic Parameters

**Sample Name:** EPA-NP-A1  
**Lab Code:** K1807185-006 ✓

**Units:** Percent  
**Basis:** Wet

| Analyte Name | Analysis Method | MRL | MDL | Sample Result | Duplicate Sample<br>K1807185-006DUP | Average | RPD  | RPD Limit |
|--------------|-----------------|-----|-----|---------------|-------------------------------------|---------|------|-----------|
|              |                 |     |     |               | Result                              |         |      |           |
| Total Solids | Freeze Dry      | -   | -   | 20.2 ✓        | 20.2 ✓                              | 20.2    | <1 ✓ | 20        |

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.



# Benchsheet

Service Request #: K1807185, KQ1810543  
 Test: Frz Dry  
 Method: Frz Dry

Run #: 601123  
 Balance ID: K-Balance-21B

| Matrix      | Lab Code        | Tare (g) | Wet Wt. (g) | Tare + Dry Wt. (g) | Dry Weight (g) | % Total Solids | RPD  |
|-------------|-----------------|----------|-------------|--------------------|----------------|----------------|------|
| Fish Tissue | K1807185-006    | 33.856   | 20.043      | 37.902             | 4.05 ✓         | 20.2 ✓         |      |
| Fish Tissue | K1807185-006DUP | 34.087   | 21.077      | 38.342             | 4.26 ✓         | 20.2 ✓         | <1 ✓ |
| Fish Tissue | K1807185-012    | 33.941   | 20.480      | 37.944             | 4.00 ✓         | 19.5 ✓         |      |
| Fish Tissue | K1807185-018    | 33.408   | 20.928      | 37.711             | 4.30 ✓         | 20.6 ✓         |      |
| Fish Tissue | K1807185-024    | 34.384   | 22.395      | 39.007             | 4.62 ✓         | 20.6 ✓         |      |
| Fish Tissue | K1807185-030    | 34.111   | 20.233      | 38.186             | 4.08 ✓         | 20.1 ✓         |      |
| Fish Tissue | K1807185-036    | 33.923   | 21.503      | 38.311             | 4.39 ✓         | 20.4 ✓         |      |

|                |          |         |          |          |                |
|----------------|----------|---------|----------|----------|----------------|
| FreezeDryer ID | Date In  | Time In | Date Out | Time Out | Thermometer ID |
| FreezeDry      | 08/20/18 | 16:26 ✓ | 08/22/18 | 08:10    |                |

|          |                 |               |            |            |          |          |
|----------|-----------------|---------------|------------|------------|----------|----------|
| Cal EQID | Cal Start Value | Cal End Value | Start Date | Start Time | End Date | End Time |
|----------|-----------------|---------------|------------|------------|----------|----------|

Comments: Data entered 8-20-18 and 8-22-18 L.J. Reviewed 8/22/18 A.B.

## ALS, Kelso

## Analytical Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish tissue

**Service Request:** K1807185  
**Date Collected:** 7/25-7/26/18  
**Date Received:** 7/28/2018

## Lipids, Total

**Prep Method:** EPA 3541  
**Analysis Method:** NOAA  
**Test Notes:**

**Units:** PERCENT  
**Basis:** As Received

| Sample Name  | Lab Code        | MRL  | Date<br>Extracted | Date<br>Analyzed | Result | Result<br>Notes |
|--------------|-----------------|------|-------------------|------------------|--------|-----------------|
| EPA-NP-A1    | K1807185-006    | 0.25 | 9/5/2018 ✓        | 9/11/2018 ✓      | 0.47 ✓ |                 |
| EPA-NP-A2    | K1807185-012    | 0.25 | 9/5/2018          | 9/11/2018        | 0.45 ✓ |                 |
| EPA-NP-A3    | K1807185-018    | 0.25 | 9/5/2018          | 9/11/2018        | 0.27 ✓ |                 |
| EPA-NP-A4    | K1807185-024    | 0.24 | 9/5/2018          | 9/11/2018        | 0.44 ✓ |                 |
| EPA-NP-A5    | K1807185-030    | 0.24 | 9/5/2018          | 9/11/2018        | 0.49 ✓ |                 |
| EPA-NP-A6    | K1807185-036    | 0.25 | 9/5/2018          | 9/11/2018        | 0.25 ✓ |                 |
| Method Blank | KQ1812195-06 MB | 0.24 | 9/5/2018          | 9/11/2018        | 0.24   | U ✓             |

Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

1A/092099p

ALS, Kelso

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish tissue

**Service Request:** K1807185  
**Date Collected:** 7/25/2018  
**Date Received:** 7/28/2018  
**Date Extracted:** 9/5/2018  
**Date Analyzed:** 9/11/2018

Triplicate Summary  
Lipids, Total

**Sample Name:** EPA-NP-A1  
**Lab Code:** K1807185-006 TRP ✓  
**Test Notes:**

**Units:** PERCENT  
**Basis:** As Received

| Analyte       | Prep Method | Analysis Method | MRL  | Sample Result | Duplicate Sample Result | Triplicate Sample Result | Average | Percent Relative Standard Deviation | Result Notes |
|---------------|-------------|-----------------|------|---------------|-------------------------|--------------------------|---------|-------------------------------------|--------------|
| Lipids, Total | EPA 3541    | NOAA            | 0.25 | 0.47 ✓        | 0.54 ✓                  | 0.55 ✓                   | 0.52    | 8 ✓                                 |              |

Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

DUP/091599p

ALS, Kelso

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Matrix:** Tissue

**Service Request:** K1807185  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 9/5/2018  
**Date Analyzed:** 9/11/2018

Laboratory Control Sample  
 Lipids, Total

Sample Name: KQ1812195-05 LCS

Units: % (percent)  
 Basis: Wet Weight

Test Notes:

| Analyte       | Prep<br>Method | Analysis<br>Method | Spike Level<br>Percent | Result | CAS<br>Advisory<br>Limits | Result<br>Notes |
|---------------|----------------|--------------------|------------------------|--------|---------------------------|-----------------|
| Lipids, Total | EPA 3541       | NOAA               | 100                    | 101 ✓  | 70-130                    |                 |

Approved By: \_\_\_\_\_ Date: \_\_\_\_\_  
 LCS (44)/091898p

| wo #             | wet wt | dish   | dish/lip | % lip    | mb corr | % lipids<br>(rounded) | MRL  |
|------------------|--------|--------|----------|----------|---------|-----------------------|------|
| K1807185-006     | 2.013  | 1.2982 | 1.3001   | 0.471932 | 0.0000  | 0.47 ✓                | 0.25 |
| K1807185-012     | 2.021  | 1.2955 | 1.2973   | 0.445324 | 0.0000  | 0.45 ✓                | 0.25 |
| K1807185-018     | 2.006  | 1.3149 | 1.3160   | 0.274177 | 0.0000  | 0.27 ✓                | 0.25 |
| K1807185-024     | 2.057  | 1.2926 | 1.2944   | 0.437530 | 0.0000  | 0.44 ✓                | 0.24 |
| K1807185-030     | 2.059  | 1.2706 | 1.2726   | 0.485673 | 0.0000  | 0.49 ✓                | 0.24 |
| K1807185-036     | 2.008  | 1.2678 | 1.2688   | 0.249004 | 0.0000  | 0.25 ✓                | 0.25 |
| KQ1812195-06 MB  | 2.087  | 1.2863 | 1.2863   | 0.000000 | 0.0000  | 0.00                  | 0.24 |
| K1807185-006 DUP | 2.022  | 1.2823 | 1.2845   | 0.544016 | 0.0000  | 0.54 ✓                | 0.25 |
| K1807185-006 TRP | 2.015  | 1.3042 | 1.3064   | 0.545906 | 0.0000  | 0.55 ✓                | 0.25 |
| KQ1812195-05 LCS | 0.934  | 1.3065 | 1.4950   | 100.9101 | 0.0000  | 101 ✓                 | 0.54 |

# Preparation Information Benchsheet

Prep Run#: 321177

Team: Semilva GC/KPRESCOTT

Prep Workflow: OrgExtT(14)

Prep Method: EPA 3540C

Status: Draft

Prep Date/Time: 9/4/18 01:11 PM

Number of Copies to make: 2

| #  | Lab Code     | Client ID        | B# | ✓   | Method / Test         | Matrix      | Amt. Ext. | pH | Int. Vol | Final Vol | Surr Amt | Spike Amt |
|----|--------------|------------------|----|-----|-----------------------|-------------|-----------|----|----------|-----------|----------|-----------|
| 1  | K1807185-006 | EPA-NP-A1        | 3F | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.013     | NA | 10       | 2         | -        | -         |
| 2  | K1807185-012 | EPA-NP-A2        | 9A | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.021     |    | 10       | 2         | -        | -         |
| 3  | K1807185-018 | EPA-NP-A3        | 9B | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.006     |    | 10       | 2         | -        | -         |
| 4  | K1807185-024 | EPA-NP-A4        | 9C | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.057     |    | 10       | 2         | -        | -         |
| 5  | K1807185-030 | EPA-NP-A5        | 9D | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.059     |    | 10       | 2         | -        | -         |
| 6  | K1807185-036 | EPA-NP-A6        | 9E | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.008     |    | 10       | 2         | -        | -         |
| 7  | K1807189-006 | EPA-NP-B1        | 9F | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.029     |    | 10       | 2         | -        | -         |
| 8  | K1807189-012 | EPA-NP-B2        | 7B | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.087     |    | 10       | 2         | -        | -         |
| 9  | K1807189-018 | EPA-NP-B3        | 7C | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.014     |    | 10       | 2         | -        | -         |
| 10 | K1807189-024 | EPA-NP-B4        | 7D | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.041     |    | 10       | 2         | -        | -         |
| 11 | K1807189-030 | EPA-NP-B5        | 7E | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.041     |    | 10       | 2         | -        | -         |
| 12 | K1807189-036 | EPA-NP-B6        | 7F | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.048     |    | 10       | 2         | -        | -         |
| 13 | KQ1812195-01 | K1807185-006 DUP | 8A | .02 | ✓ NOAA LIPID / LIPIDS | Tissue      | 2.022     |    | 10       | 2         | -        | -         |
| 14 | KQ1812195-02 | K1807185-006 TRP | 8B | .02 | ✓ NOAA LIPID / LIPIDS | Tissue      | 2.015     |    | 10       | 2         | -        | -         |
| 15 | KQ1812195-03 | K1807189-006 DUP | 8C | .02 | ✓ NOAA LIPID / LIPIDS | Tissue      | 2.017     |    | 10       | 2         | -        | -         |
| 16 | KQ1812195-04 | K1807189-006 TRP | 8D | .02 | ✓ NOAA LIPID / LIPIDS | Tissue      | 2.004     |    | 10       | 2         | -        | -         |
| 17 | KQ1812195-05 | LCS              | 8E | -   | NOAA LIPID / LIPIDS   | Tissue      | 0.934     |    | 10       | 2         | -        | 1000      |
| 18 | KQ1812195-06 | MB               | 8F | -   | NOAA LIPID / LIPIDS   | Tissue      | 2.087     |    | 10       | 2         | -        | -         |

Comments: ① Samples fell through the thimble during extraction. RPD 09/05/18.

Surrogate ID: —

Spike ID: SVMIP-005-60C XP:01/29/19 1000ul app. 4F

Witnessed By: —

Analyst: Kal. Rae Prescott

Assisted By: —

Service Request Number(s):

K1807185

## TISSUE HOMOGENIZATION

| Laboratory ID | Weight of Sample* (g) | Tare of Jar (g) |         | Homog. wt. (g) (1) |  |
|---------------|-----------------------|-----------------|---------|--------------------|--|
| K1807185-1    | 83.193                | 202.845         | 8/3/18  | 77.859             |  |
| -2            | 90.553                | 202.375         | T       | 86.818             |  |
| -3            | 82.092                | 202.870         |         | 77.133             |  |
| -4            | 135.467               | 202.427         |         | 131.425            |  |
| -5            | 144.042               | 203.349         |         | 139.177            |  |
| -7            | 71.528                | 202.244         |         | 69.046             |  |
| -8            | 106.570               | 202.385         |         | 105.108            |  |
| -9            | 106.665               | 201.999         |         | 106.096            |  |
| -10           | 95.600                | 202.561         |         | 94.924             |  |
| -11           | 118.273               | 202.735         | ↓       | 117.412            |  |
| -13           | 73.503                | 202.583         | 8/6/18  | 70.993             |  |
| -14           | 81.244                | 202.016         | 8/6/18  | 79.168             |  |
| -15           | 104.857               | 203.357         | 8/15/18 |                    |  |
| -16           | 116.347               | 202.198         | T       |                    |  |
| -17           | 127.093               | 202.399         |         |                    |  |
| -19           | 65.433                | 202.139         | ↓       |                    |  |
| -20           | 92.090                | 202.191         | 8/17/18 |                    |  |
| -21           | 90.198                | 202.318         | T       |                    |  |
| -22           | 85.037                | 202.284         |         |                    |  |
| -23           | 77.347                | 201.973         |         |                    |  |
| -25           | 97.228                | 202.457         |         |                    |  |
| -26           | 74.119                | 202.520         |         |                    |  |
| -27           | 86.750                | 202.871         |         |                    |  |
| -28           | 93.279                | 202.828         |         |                    |  |
| -29           | 149.989               | 201.960         | ↓       |                    |  |

Comments: (1) remixed with Titanium blade <sup>6.9</sup> blender.

\* The weight of sample is after homogenization.

Balance ID: K Balance 21B

Date Balance Checked: 8/31/18 8/6/18 8/15/18 8/17/18

Analyst: G. Braten

Date: 8/31/18 8/6/18 8/15/18 8/17/18

Reviewed:

T

Date: 8/20/18

Request Number(s):  
K1807155

| Laboratory ID | Weight of Sample* (g) | Tare of Jar (g) |         |  |  |
|---------------|-----------------------|-----------------|---------|--|--|
| K1807185-31   | 76.461                | 202.274         | 8/17/16 |  |  |
| -32           | 79.903                | 202.201         |         |  |  |
| -33           | 99.899                | 202.347         |         |  |  |
| -34           | 117.514               | 202.482         |         |  |  |
| -35           | 123.245               | 202.422         |         |  |  |
| N/A           |                       |                 |         |  |  |

Comments:

\* The weight of sample is after homogenization.

Balance ID: K Balance 713

Date Balance Checked: 8/17/18

Analyst:

Brentley

Date:

8/17/18

Reviewed:

49

Date:

8201



ALS Inc.

Service Request Number(s):

161607185

Rinsate and Homogenization Blank Data

| Laboratory ID        | Amount (mL)     | Date    | Time | Preservative |
|----------------------|-----------------|---------|------|--------------|
| Rinsate Blank        | 125/250/250/100 | 8/14/18 | 1205 | See below    |
| Homogenization Blank | ↓               | ↓       | 1304 | ↓            |
| Homogenization Blank | ↓               | ↓       | 1353 | ↓            |

Comments: 125ml 1631 HCl / 250ml 1632 HCl / 250ml metals HNO<sub>3</sub> / 10ml Amber 902

|                        |               |
|------------------------|---------------|
| Analyst: <i>GBauty</i> | Date: 8/14/18 |
| Reviewed: <i>4</i>     | Date: 8/20/18 |

ALS Inc.

Service Request Number(s):

K1807185

Rinsate and Homogenization Blank Data

| Laboratory ID        | Amount (mL)      | Date    | Time | Preservative |
|----------------------|------------------|---------|------|--------------|
| Rinsate Blank        | 125/250/250/1000 | 8/15/18 | 1052 | See below    |
| Homogenization Blank | J                | J       | 1315 | J            |
| Homogenization Blank | J                | J       | 1520 | J            |

Comments: 125ml 1631 HCl / 250ml 1632 HCl / 250ml metals / HNO<sub>3</sub> / 1L Amber nore

|                                                                                               |               |
|-----------------------------------------------------------------------------------------------|---------------|
| Analyst: G. Beatty                                                                            | Date: 8/15/18 |
| Reviewed:  | Date: 8/20/18 |

ALS Inc.

Service Request Number(s):

81807185

Rinsate and Homogenization Blank Data

| Laboratory ID        | Amount (mL)      | Date    | Time | Preservative |
|----------------------|------------------|---------|------|--------------|
| Rinsate Blank        | 125/250/250/1000 | 8/17/18 | 0851 | See below    |
| Homogenization Blank | ↓                | ↓       | 0957 | ↓            |
| Homogenization Blank | ↓                | ↓       | 1245 | ↓            |

Comments: 125ml 1631 HCl / 250ml 1632 HCl / 250 ml 1633 HNO<sub>3</sub> / 1L water none

|                              |               |
|------------------------------|---------------|
| Analyst: <i>E. Bratton</i>   | Date: 8/17/18 |
| Reviewed: <i>[Signature]</i> | Date: 8/20/18 |

ALS Inc.

Service Request Number(s):

K1807185

Analysis for:

FISH FILLET COMPOSITE DATA

| Service Request # | Sample Weight (g) | Homogenized Composite Wt(g) |
|-------------------|-------------------|-----------------------------|
| K1807185-001      | 40.290            |                             |
| K1807185-002      | 40.173            |                             |
| K1807185-003      | 40.228            |                             |
| K1807185-004      | 40.082            |                             |
| K1807185-005      | 40.142            |                             |
| K1807185-006      | K1807185-006      | 200.915                     |
| K1807185-007      | 40.152            |                             |
| K1807185-008      | 40.075            |                             |
| K1807185-009      | 40.186            |                             |
| K1807185-010      | 40.069            |                             |
| K1807185-011      | 40.141            |                             |
| K1807185-012      | K1807185-012      | 200.623                     |
| K1807185-013      | 40.148            |                             |
| K1807185-014      | 40.188            |                             |
| K1807185-015      | 40.156            |                             |
| K1807185-016      | 40.109            |                             |
| K1807185-017      | 40.161            |                             |
| K1807185-018      | K1807185-018      | 200.762                     |

Balance ID: K Balance 213 Date Checked: 8/20/18

Analyst:

G. Bentley

Date:

7/27/18 7/20/18

Reviewed:

7

Date:

8/20/18

ALS Inc.

Service Request Number(s):

K1807185

Analysis for:

FISH FILLET COMPOSITE DATA

| Service Request # | Sample Weight (g) | Homogenized Composite Wt(g) |
|-------------------|-------------------|-----------------------------|
| K1807185-019      | 40.022            |                             |
| K1807185-020      | 40.069            |                             |
| K1807185-021      | 40.114            |                             |
| K1807185-022      | 40.120            |                             |
| K1807185-023      | 40.061            |                             |
| K1807185-024      | K1807185-024      | 200.386                     |
| K1807185-025      | 40.165            |                             |
| K1807185-026      | 40.109            |                             |
| K1807185-027      | 40.085            |                             |
| K1807185-028      | 40.090            |                             |
| K1807185-029      | 40.081            |                             |
| K1807185-030      | K1807185-030      | 200.530                     |
| K1807185-031      | 40.110            |                             |
| K1807185-032      | 40.066            |                             |
| K1807185-033      | 40.101            |                             |
| K1807185-034      | 40.136            |                             |
| K1807185-035      | 40.129            |                             |
| K1807185-036      | K1807185-036      | 200.542                     |

Balance ID: K1807185-2113 Date Checked: 8/20/18

Analyst: C. Bratty Date: 8/20/18  
Reviewed: S Date: 8/20/18

**B. SERVICE REQUEST K1807189**



## INORGANIC ANALYSIS SUPPORT DOCUMENTATION

ESI project name: Teck UCR Northern Pike  
Sample Collection Dates: 7/25 & 7/26/18  
Job Number: 20188280  
Project Manager: Tom Weinmann  
Laboratory: ALS

Reviewed by: THW  
Approved by: AP  
Completion Date: 10/20/18

Applicable Sample No's ( x )

Refer to Table 1 in the Quality Assurance Review

Deliverable: CLP (Full) ( )  
Level IV (Full) ( x )  
Limited ( )  
Other:

Sample No. K1807189  
Lab Control No.

The following table indicates criteria that were examined, the identified problems, and support documentation attachments

|                                         | Criteria Examined in Detail                            |      |       |       |  | Problems Identified                                    |      |       |       |  | Support Documentation Attachments                      |      |       |       |  |
|-----------------------------------------|--------------------------------------------------------|------|-------|-------|--|--------------------------------------------------------|------|-------|-------|--|--------------------------------------------------------|------|-------|-------|--|
|                                         | Check (√) if Yes or Footnote Letter for Comments Below |      |       |       |  | Check (√) if Yes or Footnote Letter for Comments Below |      |       |       |  | Check (√) if Yes or Footnote Letter for Comments Below |      |       |       |  |
|                                         | 6010C/6020A                                            | 7742 | 1631E | 1632A |  | 6010C/6020A                                            | 7742 | 1631E | 1632A |  | 6010C/6020A                                            | 7742 | 1631E | 1632A |  |
| Holding Times                           | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Blank Analysis Results                  | x                                                      | x    | x     | x     |  | x                                                      |      |       |       |  | x                                                      | x    | x     | x     |  |
| Matrix Spike (Predigestion) Results     | x                                                      | x    | x     | x     |  |                                                        | x    |       | x     |  | x                                                      | x    | x     | x     |  |
| Duplicate Analysis: ( ) Field ( x ) Lab | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Quantitation of Results                 | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Detection Limit/Sensitivity             | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Initial Calibrations                    | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Continuing Calibrations                 | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Laboratory Control Standard (LCS)       | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| ICP Linear Range Analysis               | x                                                      |      |       |       |  |                                                        |      |       |       |  | x                                                      |      |       |       |  |
| ICP Interference Checks                 | x                                                      |      |       |       |  |                                                        |      |       |       |  | x                                                      |      |       |       |  |
| ICP Serial Dilutions                    | x                                                      |      |       |       |  | x                                                      |      |       |       |  | x                                                      |      |       |       |  |
| ICP Post-Digestion Spike                | x                                                      |      |       |       |  |                                                        |      |       |       |  | x                                                      |      |       |       |  |
| GFAA Post Digestion Spikes              |                                                        |      |       |       |  |                                                        |      |       |       |  |                                                        |      |       |       |  |
| GFAA Duplicate Injections               |                                                        |      |       |       |  |                                                        |      |       |       |  |                                                        |      |       |       |  |
| ICP Multiple Exposures                  |                                                        |      |       |       |  |                                                        |      |       |       |  |                                                        |      |       |       |  |
| GFAA Standard Additions                 |                                                        |      |       |       |  |                                                        |      |       |       |  |                                                        |      |       |       |  |
| CRDL Standards                          | x                                                      |      |       |       |  |                                                        |      |       |       |  | x                                                      |      |       |       |  |
| Condition on Receipt                    | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Percent Solids                          |                                                        |      |       |       |  |                                                        |      |       |       |  |                                                        |      |       |       |  |
| Others:                                 |                                                        |      |       |       |  |                                                        |      |       |       |  |                                                        |      |       |       |  |

Comments:

## BLANK ANALYSIS RESULTS FOR INORGANIC PARAMETERS

[illegible]

Aq = Aqueous; S = Solid

Notes:



ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807189

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID           | Analyte   | Method | Analysis Batch: | Result  | True Value | % Rec | % Rec. Limits |
|---------------------|-----------|--------|-----------------|---------|------------|-------|---------------|
| ICVB 08/30/18 14:42 | Aluminum  | 6010C  | 604833          | 985 ✓   | 1000       | 99 ✓  | 90-110 ✓      |
|                     | Calcium   | 6010C  | 604833          | 4860    | 5000       | 97    | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 4880    | 5000       | 98    | 90-110        |
|                     | Sulfur    | 6010C  | 604833          | 4810    | 5000       | 96    | 90-110        |
| ICV 08/30/18 14:44  | Aluminum  | 6010C  | 604833          | 4940    | 5000       | 99    | 90-110        |
|                     | Calcium   | 6010C  | 604833          | 12200   | 12500      | 98    | 90-110        |
|                     | Iron      | 6010C  | 604833          | 2530 ✓  | 2500       | 101 ✓ | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 12300   | 12500      | 99    | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 12500   | 12500      | 100   | 90-110        |
|                     | Potassium | 6010C  | 604833          | 12300   | 12500      | 98    | 90-110        |
|                     | Sodium    | 6010C  | 604833          | 12400   | 12500      | 99    | 90-110        |
| CCVB 08/30/18 14:54 | Aluminum  | 6010C  | 604833          | 10200   | 10000      | 102   | 90-110        |
|                     | Calcium   | 6010C  | 604833          | 9950    | 10000      | 99    | 90-110        |
|                     | Iron      | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 10200   | 10000      | 102   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 10000   | 10000      | 100   | 90-110        |
|                     | Potassium | 6010C  | 604833          | 9850 ✓  | 10000      | 99 ✓  | 90-110        |
|                     | Sodium    | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Sulfur    | 6010C  | 604833          | 987     | 1000       | 99    | 90-110        |
| CCVA 08/30/18 14:56 | Aluminum  | 6010C  | 604833          | 251     | 250        | 100   | 90-110        |
|                     | Calcium   | 6010C  | 604833          | 502     | 500        | 100   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 252 ✓   | 250        | 101 ✓ | 90-110        |
| CCVB 08/30/18 16:15 | Aluminum  | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Calcium   | 6010C  | 604833          | 10100 ✓ | 10000      | 101 ✓ | 90-110        |
|                     | Iron      | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Potassium | 6010C  | 604833          | 10200   | 10000      | 102   | 90-110        |
|                     | Sodium    | 6010C  | 604833          | 10000   | 10000      | 100   | 90-110        |
|                     | Sulfur    | 6010C  | 604833          | 1000    | 1000       | 100   | 90-110        |
| CCVA 08/30/18 16:19 | Aluminum  | 6010C  | 604833          | 261 ✓   | 250        | 104 ✓ | 90-110        |

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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807189

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID           | Analyte   | Method | Analysis Batch: | Result  | True Value | % Rec | % Rec. Limits |
|---------------------|-----------|--------|-----------------|---------|------------|-------|---------------|
| CCVA 08/30/18 16:19 | Calcium   | 6010C  | 604833          | 509     | 500        | 102   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 253     | 250        | 101   | 90-110        |
| CCVB 08/30/18 16:48 | Aluminum  | 6010C  | 604833          | 10300   | 10000      | 103   | 90-110        |
|                     | Calcium   | 6010C  | 604833          | 10200   | 10000      | 102   | 90-110        |
|                     | Iron      | 6010C  | 604833          | 10300   | 10000      | 103   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 10300   | 10000      | 103   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Potassium | 6010C  | 604833          | 10300 ✓ | 10000      | 103 ✓ | 90-110        |
|                     | Sodium    | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Sulfur    | 6010C  | 604833          | 1020    | 1000       | 102   | 90-110        |
| CCVA 08/30/18 16:51 | Aluminum  | 6010C  | 604833          | 260     | 250        | 104   | 90-110        |
|                     | Calcium   | 6010C  | 604833          | 512 ✓   | 500        | 102 ✓ | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 267     | 250        | 107   | 90-110        |
| CCVB 08/30/18 17:01 | Aluminum  | 6010C  | 604833          | 10400   | 10000      | 104   | 90-110        |
|                     | Calcium   | 6010C  | 604833          | 9970    | 10000      | 100   | 90-110        |
|                     | Iron      | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 10100   | 10000      | 101   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 10200   | 10000      | 102   | 90-110        |
|                     | Potassium | 6010C  | 604833          | 10400   | 10000      | 104   | 90-110        |
|                     | Sodium    | 6010C  | 604833          | 10200   | 10000      | 102   | 90-110        |
|                     | Sulfur    | 6010C  | 604833          | 1030    | 1000       | 103   | 90-110        |
| CCVA 08/30/18 17:04 | Aluminum  | 6010C  | 604833          | 262     | 250        | 105   | 90-110        |
|                     | Calcium   | 6010C  | 604833          | 499     | 500        | 100   | 90-110        |
|                     | Magnesium | 6010C  | 604833          | 251     | 250        | 100   | 90-110        |
| ICV 08/30/18 17:25  | Antimony  | 6020A  | 604807          | 12.4    | 12.5       | 100   | 90-110        |
|                     | Arsenic   | 6020A  | 604807          | 25.0 ✓  | 25.0       | 100 ✓ | 90-110        |
|                     | Barium    | 6020A  | 604807          | 98.5    | 100        | 98    | 90-110        |
|                     | Beryllium | 6020A  | 604807          | 2.52    | 2.50       | 101   | 90-110        |
|                     | Cadmium   | 6020A  | 604807          | 12.5    | 12.5       | 100   | 90-110        |
|                     | Chromium  | 6020A  | 604807          | 9.91    | 10.0       | 99    | 90-110        |
|                     | Cobalt    | 6020A  | 604807          | 24.9    | 25.0       | 99    | 90-110        |

ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807189

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec. Limits |
|--------------------|-----------|--------|-----------------|--------|------------|-------|---------------|
| ICV 08/30/18 17:25 | Copper    | 6020A  | 604807          | 12.5   | 12.5       | 100   | 90-110        |
|                    | Lead      | 6020A  | 604807          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Manganese | 6020A  | 604807          | 24.9   | 25.0       | 100   | 90-110        |
|                    | Nickel    | 6020A  | 604807          | 24.5   | 25.0       | 98    | 90-110        |
|                    | Silver    | 6020A  | 604807          | 12.6   | 12.5       | 101   | 90-110        |
|                    | Thallium  | 6020A  | 604807          | 25.1   | 25.0       | 100   | 90-110        |
|                    | Uranium   | 6020A  | 604807          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Vanadium  | 6020A  | 604807          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Zinc      | 6020A  | 604807          | 23.8   | 25.0       | 95    | 90-110        |
| CCV 08/30/18 17:29 | Antimony  | 6020A  | 604807          | 13.2   | 12.5       | 106   | 90-110        |
|                    | Arsenic   | 6020A  | 604807          | 26.5   | 25.0       | 106   | 90-110        |
|                    | Barium    | 6020A  | 604807          | 26.9   | 25.0       | 107   | 90-110        |
|                    | Beryllium | 6020A  | 604807          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Cadmium   | 6020A  | 604807          | 26.7   | 25.0       | 107   | 90-110        |
|                    | Chromium  | 6020A  | 604807          | 26.7   | 25.0       | 107   | 90-110        |
|                    | Cobalt    | 6020A  | 604807          | 26.7   | 25.0       | 107   | 90-110        |
|                    | Copper    | 6020A  | 604807          | 26.6   | 25.0       | 107   | 90-110        |
|                    | Lead      | 6020A  | 604807          | 26.3   | 25.0       | 105   | 90-110        |
|                    | Manganese | 6020A  | 604807          | 26.7   | 25.0       | 107   | 90-110        |
|                    | Nickel    | 6020A  | 604807          | 26.8   | 25.0       | 107   | 90-110        |
|                    | Silver    | 6020A  | 604807          | 13.2   | 12.5       | 106   | 90-110        |
|                    | Thallium  | 6020A  | 604807          | 26.4   | 25.0       | 106   | 90-110        |
|                    | Uranium   | 6020A  | 604807          | 26.4   | 25.0       | 106   | 90-110        |
|                    | Vanadium  | 6020A  | 604807          | 26.7   | 25.0       | 107   | 90-110        |
|                    | Zinc      | 6020A  | 604807          | 27.1   | 25.0       | 109   | 90-110        |
| CCV 08/30/18 18:19 | Antimony  | 6020A  | 604807          | 12.7   | 12.5       | 102   | 90-110        |
|                    | Arsenic   | 6020A  | 604807          | 25.1   | 25.0       | 100   | 90-110        |
|                    | Barium    | 6020A  | 604807          | 25.1   | 25.0       | 101   | 90-110        |
|                    | Beryllium | 6020A  | 604807          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Cadmium   | 6020A  | 604807          | 25.4   | 25.0       | 102   | 90-110        |
|                    | Chromium  | 6020A  | 604807          | 25.3   | 25.0       | 101   | 90-110        |
|                    | Cobalt    | 6020A  | 604807          | 25.4   | 25.0       | 102   | 90-110        |
|                    | Copper    | 6020A  | 604807          | 25.4   | 25.0       | 102   | 90-110        |
|                    | Lead      | 6020A  | 604807          | 25.4   | 25.0       | 102   | 90-110        |

ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807189

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec. Limits |
|--------------------|-----------|--------|-----------------|--------|------------|-------|---------------|
| CCV 08/30/18 18:19 | Manganese | 6020A  | 604807          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Nickel    | 6020A  | 604807          | 25.5   | 25.0       | 102   | 90-110        |
|                    | Silver    | 6020A  | 604807          | 12.6   | 12.5       | 101   | 90-110        |
|                    | Thallium  | 6020A  | 604807          | 25.6   | 25.0       | 102   | 90-110        |
|                    | Uranium   | 6020A  | 604807          | 25.5   | 25.0       | 102   | 90-110        |
|                    | Vanadium  | 6020A  | 604807          | 25.5   | 25.0       | 102   | 90-110        |
|                    | Zinc      | 6020A  | 604807          | 25.6 ✓ | 25.0       | 102 ✓ | 90-110        |
| CCV 08/30/18 18:56 | Antimony  | 6020A  | 604807          | 12.4   | 12.5       | 99    | 90-110        |
|                    | Arsenic   | 6020A  | 604807          | 24.9   | 25.0       | 100   | 90-110        |
|                    | Barium    | 6020A  | 604807          | 24.4   | 25.0       | 97    | 90-110        |
|                    | Beryllium | 6020A  | 604807          | 24.4 ✓ | 25.0       | 98 ✓  | 90-110        |
|                    | Cadmium   | 6020A  | 604807          | 25.1   | 25.0       | 101   | 90-110        |
|                    | Chromium  | 6020A  | 604807          | 25.3   | 25.0       | 101   | 90-110        |
|                    | Cobalt    | 6020A  | 604807          | 25.1   | 25.0       | 101   | 90-110        |
|                    | Copper    | 6020A  | 604807          | 24.9   | 25.0       | 100   | 90-110        |
|                    | Lead      | 6020A  | 604807          | 24.9   | 25.0       | 99    | 90-110        |
|                    | Manganese | 6020A  | 604807          | 24.8 ✓ | 25.0       | 99 ✓  | 90-110        |
|                    | Nickel    | 6020A  | 604807          | 25.1   | 25.0       | 100   | 90-110        |
|                    | Silver    | 6020A  | 604807          | 12.7   | 12.5       | 101   | 90-110        |
|                    | Thallium  | 6020A  | 604807          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Uranium   | 6020A  | 604807          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Vanadium  | 6020A  | 604807          | 25.3   | 25.0       | 101   | 90-110        |
|                    | Zinc      | 6020A  | 604807          | 25.0   | 25.0       | 100   | 90-110        |
| CCV 08/30/18 19:12 | Antimony  | 6020A  | 604807          | 12.4   | 12.5       | 100   | 90-110        |
|                    | Arsenic   | 6020A  | 604807          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Barium    | 6020A  | 604807          | 24.6   | 25.0       | 98    | 90-110        |
|                    | Beryllium | 6020A  | 604807          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Cadmium   | 6020A  | 604807          | 25.5   | 25.0       | 102   | 90-110        |
|                    | Chromium  | 6020A  | 604807          | 26.0   | 25.0       | 104   | 90-110        |
|                    | Cobalt    | 6020A  | 604807          | 25.6   | 25.0       | 102   | 90-110        |
|                    | Copper    | 6020A  | 604807          | 25.5   | 25.0       | 102   | 90-110        |
|                    | Lead      | 6020A  | 604807          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Manganese | 6020A  | 604807          | 25.5   | 25.0       | 102   | 90-110        |
|                    | Nickel    | 6020A  | 604807          | 25.6   | 25.0       | 102   | 90-110        |

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807189

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID          | Analyte  | Method | Analysis Batch: | Result | True Value | % Rec | % Rec. Limits |
|--------------------|----------|--------|-----------------|--------|------------|-------|---------------|
| CCV 08/30/18 19:12 | Silver   | 6020A  | 604807          | 12.8   | 12.5       | 103   | 90-110        |
|                    | Thallium | 6020A  | 604807          | 25.1   | 25.0       | 100   | 90-110        |
|                    | Uranium  | 6020A  | 604807          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Vanadium | 6020A  | 604807          | 25.9   | 25.0       | 103   | 90-110        |
|                    | Zinc     | 6020A  | 604807          | 25.7   | 25.0       | 103   | 90-110        |
| ICV 08/31/18 11:21 | Selenium | 7742   | 605054          | 4.13 ✓ | 4.00       | 103 ✓ | 90-110        |
| CCV 08/31/18 11:27 | Selenium | 7742   | 605054          | 4.22 ✓ | 4.00       | 106 ✓ | 90-110        |
| CCV 08/31/18 11:55 | Selenium | 7742   | 605054          | 4.20 ✓ | 4.00       | 105 ✓ | 90-110        |
| CCV 08/31/18 12:23 | Selenium | 7742   | 605054          | 4.14 ✓ | 4.00       | 104 ✓ | 90-110        |
| CCV 08/31/18 12:51 | Selenium | 7742   | 605054          | 3.97 ✓ | 4.00       | 99 ✓  | 90-110        |
| CCV 08/31/18 13:36 | Selenium | 7742   | 605054          | 4.04 ✓ | 4.00       | 101 ✓ | 90-110        |
| CCV 08/31/18 14:01 | Selenium | 7742   | 605054          | 4.04 ✓ | 4.00       | 101 ✓ | 90-110        |

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807189

LOW LEVEL INITIAL AND LOW LEVEL CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID | Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec. Limits | Analysis Date  |
|-----------|-----------|--------|-----------------|--------|------------|-------|---------------|----------------|
| LLICV     | Aluminum  | 6010C  | 604833          | 10.3   | 10.0       | 103   | 70-130        | 08/30/18 14:49 |
|           | Calcium   | 6010C  | 604833          | 20.2   | 20.0       | 101   | 70-130        | 08/30/18 14:49 |
|           | Magnesium | 6010C  | 604833          | 4.8    | 5.0        | 96    | 70-130        | 08/30/18 14:49 |
|           | Potassium | 6010C  | 604833          | 205    | 200        | 103   | 70-130        | 08/30/18 14:49 |
|           | Sodium    | 6010C  | 604833          | 172    | 200        | 86    | 70-130        | 08/30/18 14:49 |
| LLICV     | Iron      | 6010C  | 604833          | 49.7   | 40.0       | 124   | 70-130        | 08/30/18 14:51 |
|           | Sulfur    | 6010C  | 604833          | 80.0   | 80.0       | 100   | 70-130        | 08/30/18 14:51 |
| LLCCV     | Aluminum  | 6010C  | 604833          | 9.7    | 10.0       | 97    | 70-130        | 08/30/18 17:09 |
|           | Calcium   | 6010C  | 604833          | 20.6   | 20.0       | 103   | 70-130        | 08/30/18 17:09 |
|           | Magnesium | 6010C  | 604833          | 4.8    | 5.0        | 96    | 70-130        | 08/30/18 17:09 |
|           | Sodium    | 6010C  | 604833          | 183    | 200        | 92    | 70-130        | 08/30/18 17:09 |
| LLCCV     | Potassium | 6010C  | 604833          | 432    | 400        | 108   | 70-130        | 08/30/18 17:14 |
|           | Sulfur    | 6010C  | 604833          | 83.3   | 80.0       | 104   | 70-130        | 08/30/18 17:14 |
| LLCCV     | Iron      | 6010C  | 604833          | 63.4   | 80.0       | 79    | 70-130        | 08/30/18 17:20 |
| LLICVT    | Antimony  | 6020A  | 604807          | 0.11   | 0.1        | 109   | 70-130        | 08/30/18 17:38 |
|           | Arsenic   | 6020A  | 604807          | 0.94   | 1.0        | 94    | 70-130        | 08/30/18 17:38 |
|           | Barium    | 6020A  | 604807          | 0.10   | 0.1        | 105   | 70-130        | 08/30/18 17:38 |
|           | Beryllium | 6020A  | 604807          | 0.042  | 0.04       | 105   | 70-130        | 08/30/18 17:38 |
|           | Cadmium   | 6020A  | 604807          | 0.043  | 0.04       | 107   | 70-130        | 08/30/18 17:38 |
|           | Chromium  | 6020A  | 604807          | 0.39   | 0.4        | 98    | 70-130        | 08/30/18 17:38 |
|           | Cobalt    | 6020A  | 604807          | 0.038  | 0.04       | 96    | 70-130        | 08/30/18 17:38 |
|           | Copper    | 6020A  | 604807          | 0.20   | 0.2        | 102   | 70-130        | 08/30/18 17:38 |
|           | Lead      | 6020A  | 604807          | 0.044  | 0.04       | 110   | 70-130        | 08/30/18 17:38 |
|           | Manganese | 6020A  | 604807          | 0.11   | 0.1        | 111   | 70-130        | 08/30/18 17:38 |
|           | Nickel    | 6020A  | 604807          | 0.42   | 0.4        | 104   | 70-130        | 08/30/18 17:38 |
|           | Silver    | 6020A  | 604807          | 0.038  | 0.04       | 96    | 70-130        | 08/30/18 17:38 |
|           | Thallium  | 6020A  | 604807          | 0.047  | 0.04       | 117   | 70-130        | 08/30/18 17:38 |
|           | Uranium   | 6020A  | 604807          | 0.038  | 0.04       | 96    | 70-130        | 08/30/18 17:38 |
|           | Vanadium  | 6020A  | 604807          | 0.42   | 0.4        | 104   | 70-130        | 08/30/18 17:38 |
|           | Zinc      | 6020A  | 604807          | 0.97   | 1.0        | 97    | 70-130        | 08/30/18 17:38 |

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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807189

LOW LEVEL INITIAL AND LOW LEVEL CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID | Analyte   | Method | Analysis Batch: | Result  | True Value | % Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|-----------|--------|-----------------|---------|------------|-------|------------------|----------------|
| LLCCVT    |           |        |                 |         |            |       |                  |                |
|           | Antimony  | 6020A  | 604807          | 0.11    | 0.1        | 114   | 70-130           | 08/30/18 19:18 |
|           | Arsenic   | 6020A  | 604807          | 1.0     | 1.0        | 102   | 70-130           | 08/30/18 19:18 |
|           | Barium    | 6020A  | 604807          | 0.11    | 0.1        | 106   | 70-130           | 08/30/18 19:18 |
|           | Beryllium | 6020A  | 604807          | 0.038   | 0.04       | 95    | 70-130           | 08/30/18 19:18 |
|           | Cadmium   | 6020A  | 604807          | 0.048   | 0.04       | 119   | 70-130           | 08/30/18 19:18 |
|           | Chromium  | 6020A  | 604807          | 0.42 ✓  | 0.4        | 104 ✓ | 70-130           | 08/30/18 19:18 |
|           | Cobalt    | 6020A  | 604807          | 0.040   | 0.04       | 101   | 70-130           | 08/30/18 19:18 |
|           | Copper    | 6020A  | 604807          | 0.20    | 0.2        | 98    | 70-130           | 08/30/18 19:18 |
|           | Lead      | 6020A  | 604807          | 0.042   | 0.04       | 104   | 70-130           | 08/30/18 19:18 |
|           | Manganese | 6020A  | 604807          | 0.11    | 0.1        | 109   | 70-130           | 08/30/18 19:18 |
|           | Nickel    | 6020A  | 604807          | 0.41    | 0.4        | 103   | 70-130           | 08/30/18 19:18 |
|           | Silver    | 6020A  | 604807          | 0.038 ✓ | 0.04       | 96 ✓  | 70-130           | 08/30/18 19:18 |
|           | Thallium  | 6020A  | 604807          | 0.045   | 0.04       | 112   | 70-130           | 08/30/18 19:18 |
|           | Uranium   | 6020A  | 604807          | 0.039   | 0.04       | 97    | 70-130           | 08/30/18 19:18 |
|           | Vanadium  | 6020A  | 604807          | 0.40    | 0.4        | 99    | 70-130           | 08/30/18 19:18 |
|           | Zinc      | 6020A  | 604807          | 1.1     | 1.0        | 105   | 70-130           | 08/30/18 19:18 |
| LLICV     |           |        |                 |         |            |       |                  |                |
|           | Selenium  | 7742   | 605054          | 0.19 ✓  | 0.2        | 94 ✓  | 70-130           | 08/31/18 11:25 |

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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807189

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | C |
|--------------------|-----------|--------|-----------------|--------|---|
| ICB 08/30/18 14:46 | Aluminum  | 6010C  | 604833          | 3      | U |
|                    | Calcium   | 6010C  | 604833          | 20     | U |
|                    | Iron      | 6010C  | 604833          | 20     | J |
|                    | Magnesium | 6010C  | 604833          | 6      | U |
|                    | Potassium | 6010C  | 604833          | 90     | U |
|                    | Sodium    | 6010C  | 604833          | 20     | U |
|                    | Sulfur    | 6010C  | 604833          | 10     | U |
| CCB 08/30/18 15:29 | Aluminum  | 6010C  | 604833          | 3      | U |
|                    | Calcium   | 6010C  | 604833          | 20     | U |
|                    | Iron      | 6010C  | 604833          | 30     | J |
|                    | Magnesium | 6010C  | 604833          | 6      | U |
|                    | Potassium | 6010C  | 604833          | 90     | U |
|                    | Sodium    | 6010C  | 604833          | -28.2  | J |
|                    | Sulfur    | 6010C  | 604833          | 10     | U |
| CCB 08/30/18 16:22 | Aluminum  | 6010C  | 604833          | 3      | U |
|                    | Calcium   | 6010C  | 604833          | 20     | U |
|                    | Iron      | 6010C  | 604833          | 20     | J |
|                    | Magnesium | 6010C  | 604833          | 6      | U |
|                    | Potassium | 6010C  | 604833          | 90     | U |
|                    | Sodium    | 6010C  | 604833          | 20     | U |
|                    | Sulfur    | 6010C  | 604833          | 10     | U |
| CCB 08/30/18 16:54 | Aluminum  | 6010C  | 604833          | 3      | U |
|                    | Calcium   | 6010C  | 604833          | 20     | U |
|                    | Iron      | 6010C  | 604833          | 10     | U |
|                    | Magnesium | 6010C  | 604833          | 6      | U |
|                    | Potassium | 6010C  | 604833          | 160    | J |
|                    | Sodium    | 6010C  | 604833          | 20     | U |
|                    | Sulfur    | 6010C  | 604833          | 10     | U |
| CCB 08/30/18 17:06 | Aluminum  | 6010C  | 604833          | 3      | U |
|                    | Calcium   | 6010C  | 604833          | 20     | U |
|                    | Iron      | 6010C  | 604833          | 21     | J |
|                    | Magnesium | 6010C  | 604833          | 6      | U |

U\* Fe  
in -006, -018

no impact



ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807189

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | C |
|--------------------|-----------|--------|-----------------|--------|---|
| CCB 08/30/18 17:06 | Potassium | 6010C  | 604833          | 90     | U |
|                    | Sodium    | 6010C  | 604833          | 20     | U |
|                    | Sulfur    | 6010C  | 604833          | 10     | U |
| ICB 08/30/18 17:32 | Antimony  | 6020A  | 604807          | 0.01   | U |
|                    | Arsenic   | 6020A  | 604807          | 0.04   | U |
|                    | Barium    | 6020A  | 604807          | 0.04   | U |
|                    | Beryllium | 6020A  | 604807          | 0.016  | U |
|                    | Cadmium   | 6020A  | 604807          | 0.006  | U |
|                    | Chromium  | 6020A  | 604807          | 0.04   | U |
|                    | Cobalt    | 6020A  | 604807          | 0.006  | U |
|                    | Copper    | 6020A  | 604807          | 0.06   | U |
|                    | Lead      | 6020A  | 604807          | 0.006  | U |
|                    | Manganese | 6020A  | 604807          | 0.02   | U |
|                    | Nickel    | 6020A  | 604807          | 0.04   | U |
|                    | Silver    | 6020A  | 604807          | 0.004  | U |
|                    | Thallium  | 6020A  | 604807          | 0.004  | U |
|                    | Uranium   | 6020A  | 604807          | 0.004  | U |
|                    | Vanadium  | 6020A  | 604807          | 0.04   | U |
|                    | Zinc      | 6020A  | 604807          | 0.2    | U |
| CCB 08/30/18 17:35 | Antimony  | 6020A  | 604807          | 0.01   | U |
|                    | Arsenic   | 6020A  | 604807          | 0.04   | U |
|                    | Barium    | 6020A  | 604807          | 0.04   | U |
|                    | Beryllium | 6020A  | 604807          | 0.016  | U |
|                    | Cadmium   | 6020A  | 604807          | 0.006  | U |
|                    | Chromium  | 6020A  | 604807          | 0.04   | U |
|                    | Cobalt    | 6020A  | 604807          | 0.006  | U |
|                    | Copper    | 6020A  | 604807          | 0.06   | U |
|                    | Lead      | 6020A  | 604807          | 0.006  | U |
|                    | Manganese | 6020A  | 604807          | 0.02   | U |
|                    | Nickel    | 6020A  | 604807          | 0.04   | U |
|                    | Silver    | 6020A  | 604807          | 0.004  | U |
|                    | Thallium  | 6020A  | 604807          | 0.004  | U |
|                    | Uranium   | 6020A  | 604807          | 0.004  | U |
|                    | Vanadium  | 6020A  | 604807          | 0.04   | U |

ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807189

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | C |
|--------------------|-----------|--------|-----------------|--------|---|
| CCB 08/30/18 17:35 | Zinc      | 6020A  | 604807          | 0.2    | U |
| CCB 08/30/18 18:22 | Antimony  | 6020A  | 604807          | 0.01   | U |
|                    | Arsenic   | 6020A  | 604807          | 0.04   | U |
|                    | Barium    | 6020A  | 604807          | 0.04   | U |
|                    | Beryllium | 6020A  | 604807          | 0.016  | U |
|                    | Cadmium   | 6020A  | 604807          | 0.006  | U |
|                    | Chromium  | 6020A  | 604807          | 0.04   | U |
|                    | Cobalt    | 6020A  | 604807          | 0.006  | U |
|                    | Copper    | 6020A  | 604807          | 0.06   | U |
|                    | Lead      | 6020A  | 604807          | 0.006  | J |
|                    | Manganese | 6020A  | 604807          | 0.02   | U |
|                    | Nickel    | 6020A  | 604807          | 0.04   | U |
|                    | Silver    | 6020A  | 604807          | 0.004  | U |
|                    | Thallium  | 6020A  | 604807          | 0.004  | U |
|                    | Uranium   | 6020A  | 604807          | 0.004  | U |
|                    | Vanadium  | 6020A  | 604807          | 0.04   | U |
|                    | Zinc      | 6020A  | 604807          | 0.2    | U |
| CCB 08/30/18 18:59 | Antimony  | 6020A  | 604807          | 0.01   | U |
|                    | Arsenic   | 6020A  | 604807          | 0.04   | U |
|                    | Barium    | 6020A  | 604807          | 0.04   | U |
|                    | Beryllium | 6020A  | 604807          | 0.016  | U |
|                    | Cadmium   | 6020A  | 604807          | 0.006  | U |
|                    | Chromium  | 6020A  | 604807          | 0.04   | U |
|                    | Cobalt    | 6020A  | 604807          | 0.006  | U |
|                    | Copper    | 6020A  | 604807          | 0.06   | U |
|                    | Lead      | 6020A  | 604807          | 0.006  | U |
|                    | Manganese | 6020A  | 604807          | 0.02   | U |
|                    | Nickel    | 6020A  | 604807          | 0.04   | U |
|                    | Silver    | 6020A  | 604807          | 0.004  | U |
|                    | Thallium  | 6020A  | 604807          | 0.004  | U |
|                    | Uranium   | 6020A  | 604807          | 0.004  | U |
|                    | Vanadium  | 6020A  | 604807          | 0.04   | U |
|                    | Zinc      | 6020A  | 604807          | 0.2    | U |

no impact

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807189

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | C |
|--------------------|-----------|--------|-----------------|--------|---|
| CCB 08/30/18 19:15 |           |        |                 |        |   |
|                    | Antimony  | 6020A  | 604807          | 0.01   | U |
|                    | Arsenic   | 6020A  | 604807          | 0.04   | U |
|                    | Barium    | 6020A  | 604807          | 0.04   | U |
|                    | Beryllium | 6020A  | 604807          | 0.016  | U |
|                    | Cadmium   | 6020A  | 604807          | 0.006  | U |
|                    | Chromium  | 6020A  | 604807          | 0.04   | U |
|                    | Cobalt    | 6020A  | 604807          | 0.006  | U |
|                    | Copper    | 6020A  | 604807          | 0.06   | U |
|                    | Lead      | 6020A  | 604807          | 0.006  | U |
|                    | Manganese | 6020A  | 604807          | 0.02   | U |
|                    | Nickel    | 6020A  | 604807          | 0.04   | U |
|                    | Silver    | 6020A  | 604807          | 0.004  | U |
|                    | Thallium  | 6020A  | 604807          | 0.004  | U |
|                    | Uranium   | 6020A  | 604807          | 0.004  | U |
|                    | Vanadium  | 6020A  | 604807          | 0.04   | U |
|                    | Zinc      | 6020A  | 604807          | 0.2    | U |
| ICB 08/31/18 11:23 |           |        |                 |        |   |
|                    | Selenium  | 7742   | 605054          | 0.20   | U |
| CCB 08/31/18 11:30 |           |        |                 |        |   |
|                    | Selenium  | 7742   | 605054          | 0.20   | U |
| CCB 08/31/18 11:58 |           |        |                 |        |   |
|                    | Selenium  | 7742   | 605054          | 0.20   | U |
| CCB 08/31/18 12:26 |           |        |                 |        |   |
|                    | Selenium  | 7742   | 605054          | 0.20   | U |
| CCB 08/31/18 12:53 |           |        |                 |        |   |
|                    | Selenium  | 7742   | 605054          | 0.20   | U |
| CCB 08/31/18 13:38 |           |        |                 |        |   |
|                    | Selenium  | 7742   | 605054          | 0.20   | U |
| CCB 08/31/18 14:03 |           |        |                 |        |   |
|                    | Selenium  | 7742   | 605054          | 0.20   | U |

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Analytical Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish Tissue  
**Sample Name:** Method Blank  
**Lab Code:** KQ1811997-01

**Service Request:** K1807189

**Date Collected:** NA

**Date Received:** NA

**Basis:** Dry

Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL   | MDL   | Dil. | Date Analyzed  | Date Extracted | Q |
|--------------|-----------------|--------|-------|-------|-------|------|----------------|----------------|---|
| Aluminum     | 6010C           | ND U   | mg/Kg | 1     | 0.3   | 1    | 08/30/18 15:51 | 08/29/18       |   |
| Antimony     | 6020A           | ND U   | mg/Kg | 0.05  | 0.005 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Arsenic      | 6020A           | ND U   | mg/Kg | 0.5   | 0.02  | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Barium       | 6020A           | ND U   | mg/Kg | 0.05  | 0.020 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Beryllium    | 6020A           | ND U   | mg/Kg | 0.020 | 0.008 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Cadmium      | 6020A           | ND U   | mg/Kg | 0.020 | 0.003 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Calcium      | 6010C           | ND U   | mg/Kg | 4     | 2.0   | 1    | 08/30/18 15:51 | 08/29/18       |   |
| Chromium     | 6020A           | ND U   | mg/Kg | 0.20  | 0.02  | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Cobalt       | 6020A           | ND U   | mg/Kg | 0.020 | 0.003 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Copper       | 6020A           | ND U   | mg/Kg | 0.10  | 0.03  | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Iron         | 6010C           | 1.0 J  | mg/Kg | 8     | 1.0   | 1    | 08/30/18 15:51 | 08/29/18       |   |
| Lead         | 6020A           | ND U   | mg/Kg | 0.020 | 0.003 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Magnesium    | 6010C           | ND U   | mg/Kg | 1     | 0.6   | 1    | 08/30/18 15:51 | 08/29/18       |   |
| Manganese    | 6020A           | ND U   | mg/Kg | 0.05  | 0.010 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Nickel       | 6020A           | ND U   | mg/Kg | 0.20  | 0.02  | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Potassium    | 6010C           | ND U   | mg/Kg | 40    | 9     | 1    | 08/30/18 15:51 | 08/29/18       |   |
| Selenium     | 7742            | ND U   | mg/Kg | 0.10  | 0.05  | 5    | 08/31/18 11:32 | 08/29/18       |   |
| Silver       | 6020A           | ND U   | mg/Kg | 0.020 | 0.002 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Sodium       | 6010C           | ND U   | mg/Kg | 20    | 2     | 1    | 08/30/18 15:51 | 08/29/18       |   |
| Sulfur       | 6010C           | ND U   | mg/Kg | 8     | 1.0   | 1    | 08/30/18 15:51 | 08/29/18       |   |
| Thallium     | 6020A           | ND U   | mg/Kg | 0.020 | 0.002 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Uranium      | 6020A           | ND U   | mg/Kg | 0.020 | 0.002 | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Vanadium     | 6020A           | ND U   | mg/Kg | 0.20  | 0.02  | 5    | 08/30/18 17:50 | 08/29/18       |   |
| Zinc         | 6020A           | ND U   | mg/Kg | 0.5   | 0.08  | 5    | 08/30/18 17:50 | 08/29/18       |   |

no impact

ALS Group USA, Corp.

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807189

ICP INTERFERENCE CHECK SAMPLE

**Sample ID** ICSA

**Concentration Units:** ug/L

| Analyte   | Method | Analysis Batch: | Result   | True Value | % Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|--------|-----------------|----------|------------|-------|------------------|----------------|
| Iron      | 6010C  | 604833          | 190000 ✓ | -          | 95    | 80-120           | 08/30/18 15:34 |
| Potassium | 6010C  | 604833          | 90 ✓     | -          | -     | -                | 08/30/18 15:34 |
| Sodium    | 6010C  | 604833          | 20 ✓     | -          | -     | -                | 08/30/18 15:34 |
| Sulfur    | 6010C  | 604833          | 10 ✓     | -          | -     | -                | 08/30/18 15:34 |

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807189

ICP INTERFERENCE CHECK SAMPLE

Sample ID ICSAB

Concentration Units: ug/L

| Analyte   | Method | Analysis Batch: | Result   | True Value | % Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|--------|-----------------|----------|------------|-------|------------------|----------------|
| Iron      | 6010C  | 604833          | 187000 ✓ | -          | 94 -  | 80-120           | 08/30/18 15:36 |
| Potassium | 6010C  | 604833          | 90 ✓     | -          | -     | -                | 08/30/18 15:36 |
| Sodium    | 6010C  | 604833          | 20 ✓     | -          | -     | -                | 08/30/18 15:36 |
| Sulfur    | 6010C  | 604833          | 10 ✓     | -          | -     | -                | 08/30/18 15:36 |

Sample Name: ICSA Acquired: 8/30/2018 15:34:00 Type: QC  
 Method: 2018A-6010-ICP04(v49) Mode: CONC Corr. Factor: 1.000000  
 User: admin Dilution: 1 Test Type: Sample Type:  
 Comment: ICP17-57-C

| Elem   | Al1670 | Al3944 | Sb2068 | As1890 | Ba4554 | Be2348  | B_2496 | Cd2144 |
|--------|--------|--------|--------|--------|--------|---------|--------|--------|
| Units  | ppm    | ppm    | ppm    | ppm    | ppm    | ppm     | ppm    | ppm    |
| Avg    | 26.74  | 476.7  | .0039  | -.0081 | .0002  | -.00024 | -.2825 | .0046  |
| Stddev | .04    | 2.2    | .0038  | .0053  | .0002  | .00029  | .0063  | .0001  |
| %RSD   | .1562  | .4674  | 96.35  | 65.91  | 107.2  | 120.48  | 2.220  | 2.298  |

|    |       |       |       |        |       |         |        |       |
|----|-------|-------|-------|--------|-------|---------|--------|-------|
| #1 | 26.77 | 475.1 | .0013 | -.0118 | .0000 | -.00045 | -.2870 | .0045 |
| #2 | 26.71 | 478.2 | .0066 | -.0043 | .0003 | -.00004 | -.2781 | .0047 |

|         |      |      |      |      |      |      |      |      |
|---------|------|------|------|------|------|------|------|------|
| Check ? | None | None | None | None | None | None | None | None |
| Value   |      |      |      |      |      |      |      |      |
| Range   |      |      |      |      |      |      |      |      |

| Elem   | Cd2265 | Ca3158 | Ca3933 | Cr2677 | Co2307 | Cu2247 | Cu3273 | Fe2599 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Units  | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    |
| Avg    | -.0051 | 485.3  | *****  | -.0035 | -.0072 | .0400  | -.0060 | 189.7  |
| Stddev | .0001  | .3     | -----  | .0011  | .0002  | .0013  | .0003  | .3     |
| %RSD   | 1.027  | .0580  | -----  | 31.62  | 2.901  | 3.201  | 5.740  | .1511  |

|    |        |       |       |        |        |       |        |       |
|----|--------|-------|-------|--------|--------|-------|--------|-------|
| #1 | -.0052 | 485.1 | ----- | -.0043 | -.0073 | .0409 | -.0062 | 189.5 |
| #2 | -.0051 | 485.5 | ----- | -.0027 | -.0070 | .0391 | -.0057 | 189.9 |

|         |      |          |      |      |      |      |      |          |
|---------|------|----------|------|------|------|------|------|----------|
| Check ? | None | Chk Pass | None | None | None | None | None | Chk Pass |
| Value   |      |          |      |      |      |      |      |          |
| Range   |      |          |      |      |      |      |      |          |

| Elem   | Pb2203 | Li6707 | Mg2790 | Mg2795 | Mg2852 | Mn2576  | Mn2605 | Mo2020 |
|--------|--------|--------|--------|--------|--------|---------|--------|--------|
| Units  | ppm    | ppm    | ppm    | ppm    | ppm    | ppm     | ppm    | ppm    |
| Avg    | -.0043 | .0059  | 527.6  | 242.4  | 462.8  | -.01679 | .0034  | -.0034 |
| Stddev | .0001  | .0009  | .7     | .3     | 2.1    | .00000  | .0010  | .0003  |
| %RSD   | 3.406  | 15.84  | .1389  | .1235  | .4577  | .01491  | 28.86  | 8.308  |

|    |        |       |       |       |       |         |       |        |
|----|--------|-------|-------|-------|-------|---------|-------|--------|
| #1 | -.0044 | .0066 | 527.1 | 242.2 | 461.3 | -.01679 | .0027 | -.0036 |
| #2 | -.0042 | .0053 | 528.1 | 242.6 | 464.3 | -.01679 | .0041 | -.0032 |

|         |      |      |          |      |      |      |      |      |
|---------|------|------|----------|------|------|------|------|------|
| Check ? | None | None | Chk Pass | None | None | None | None | None |
| Value   |      |      |          |      |      |      |      |      |
| Range   |      |      |          |      |      |      |      |      |

Sample Name: ICSAB Acquired: 8/30/2018 15:36:45 Type: QC  
 Method: 2018A-6010-ICP04(v49) Mode: CONC Corr. Factor: 1.000000  
 User: admin Dilution: 1 Test Type: Sample Type:  
 Comment: ICP17-57-D

| Elem   | Al1670 | Al3944 | Sb2068 | As1890 | Ba4554 | Be2348 | B_2496 | Cd2144 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Units  | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    |
| Avg    | 26.89  | 473.2  | .9519  | -.0114 | .4952  | .52136 | -.2561 | .9691  |
| Stddev | .05    | 5.7    | .0100  | .0058  | .0018  | .00391 | .0046  | .0029  |
| %RSD   | .1762  | 1.208  | 1.051  | 50.92  | .3573  | .74996 | 1.808  | .3018  |

|    |       |       |       |        |       |        |        |       |
|----|-------|-------|-------|--------|-------|--------|--------|-------|
| #1 | 26.92 | 477.2 | .9590 | -.0156 | .4965 | .51860 | -.2593 | .9711 |
| #2 | 26.85 | 469.1 | .9448 | -.0073 | .4940 | .52413 | -.2528 | .9670 |

|         |      |      |          |      |          |          |      |          |
|---------|------|------|----------|------|----------|----------|------|----------|
| Check ? | None | None | Chk Pass | None | Chk Pass | Chk Pass | None | Chk Pass |
| Value   |      |      |          |      |          |          |      |          |
| Range   |      |      |          |      |          |          |      |          |

| Elem   | Cd2265 | Ca3158 | Ca3933 | Cr2677 | Co2307 | Cu2247 | Cu3273 | Fe2599 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Units  | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    |
| Avg    | .9518  | 477.5  | *****  | .5025  | .4523  | .5100  | .4630  | 187.0  |
| Stddev | .0035  | 3.8    | -----  | .0030  | .0012  | .0020  | .0022  | 1.4    |
| %RSD   | .3696  | .7903  | -----  | .5991  | .2678  | .3944  | .4649  | .7220  |

|    |       |       |       |       |       |       |       |       |
|----|-------|-------|-------|-------|-------|-------|-------|-------|
| #1 | .9543 | 480.2 | ----- | .5047 | .4532 | .5114 | .4614 | 188.0 |
| #2 | .9493 | 474.9 | ----- | .5004 | .4515 | .5086 | .4645 | 186.1 |

|         |          |          |      |          |          |          |          |          |
|---------|----------|----------|------|----------|----------|----------|----------|----------|
| Check ? | Chk Pass | Chk Pass | None | Chk Pass | Chk Pass | Chk Pass | Chk Pass | Chk Pass |
| Value   |          |          |      |          |          |          |          |          |
| Range   |          |          |      |          |          |          |          |          |

| Elem   | Pb2203 | Li6707 | Mg2790 | Mg2795 | Mg2852 | Mn2576 | Mn2605 | Mo2020 |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Units  | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    | ppm    |
| Avg    | .9174  | .0035  | 519.3  | 241.2  | 460.8  | .47583 | .5293  | -.0029 |
| Stddev | .0052  | .0018  | 5.1    | 1.6    | 4.6    | .00034 | .0070  | .0003  |
| %RSD   | .5675  | 51.53  | .9814  | .6715  | .9898  | .07070 | 1.324  | 11.11  |

|    |       |       |       |       |       |        |       |        |
|----|-------|-------|-------|-------|-------|--------|-------|--------|
| #1 | .9211 | .0048 | 522.9 | 242.3 | 457.6 | .47607 | .5343 | -.0032 |
| #2 | .9138 | .0022 | 515.7 | 240.0 | 464.0 | .47559 | .5244 | -.0027 |

|         |          |      |          |      |      |          |          |      |
|---------|----------|------|----------|------|------|----------|----------|------|
| Check ? | Chk Pass | None | Chk Pass | None | None | Chk Pass | Chk Pass | None |
| Value   |          |      |          |      |      |          |          |      |
| Range   |          |      |          |      |      |          |          |      |



ALS Group USA, Corp.

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807189

ICP INTERFERENCE CHECK SAMPLE

Sample ID ICSA

Concentration Units: ug/L

| Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|--------|-----------------|--------|------------|-------|------------------|----------------|
| Antimony  | 6020A  | 604807          | 0.09   | -          | -     | -                | 08/30/18 17:41 |
| Arsenic   | 6020A  | 604807          | 0.2    | -          | -     | -                | 08/30/18 17:41 |
| Barium    | 6020A  | 604807          | 0.27   | -          | -     | -                | 08/30/18 17:41 |
| Beryllium | 6020A  | 604807          | 0.016  | -          | -     | -                | 08/30/18 17:41 |
| Cadmium   | 6020A  | 604807          | 0.030  | -          | -     | -                | 08/30/18 17:41 |
| Chromium  | 6020A  | 604807          | 1.16   | -          | -     | -                | 08/30/18 17:41 |
| Cobalt    | 6020A  | 604807          | 1.16   | -          | -     | -                | 08/30/18 17:41 |
| Copper    | 6020A  | 604807          | 0.81   | -          | -     | -                | 08/30/18 17:41 |
| Lead      | 6020A  | 604807          | 0.149  | -          | -     | -                | 08/30/18 17:41 |
| Manganese | 6020A  | 604807          | 1.14   | -          | -     | -                | 08/30/18 17:41 |
| Nickel    | 6020A  | 604807          | 1.46   | -          | -     | -                | 08/30/18 17:41 |
| Silver    | 6020A  | 604807          | 0.010  | -          | -     | -                | 08/30/18 17:41 |
| Thallium  | 6020A  | 604807          | 0.011  | -          | -     | -                | 08/30/18 17:41 |
| Uranium   | 6020A  | 604807          | 0.009  | -          | -     | -                | 08/30/18 17:41 |
| Vanadium  | 6020A  | 604807          | 0.04   | -          | -     | -                | 08/30/18 17:41 |
| Zinc      | 6020A  | 604807          | 0.4    | -          | -     | -                | 08/30/18 17:41 |

AI 20000

Mo 50

low interferents in samples, no impact

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807189

ICP INTERFERENCE CHECK SAMPLE

**Sample ID** ICSAB

**Concentration Units:** ug/L

| Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|--------|-----------------|--------|------------|-------|------------------|----------------|
| Antimony  | 6020A  | 604807          | 0.09   | -          | -     | -                | 08/30/18 17:44 |
| Arsenic   | 6020A  | 604807          | 23.5 ✓ | 25.0       | 94 ✓  | 80-120           | 08/30/18 17:44 |
| Barium    | 6020A  | 604807          | 0.27   | -          | -     | -                | 08/30/18 17:44 |
| Beryllium | 6020A  | 604807          | 0.016  | -          | -     | -                | 08/30/18 17:44 |
| Cadmium   | 6020A  | 604807          | 24.5   | 25.0       | 98    | 80-120           | 08/30/18 17:44 |
| Chromium  | 6020A  | 604807          | 45.6   | 50.0       | 91    | 80-120           | 08/30/18 17:44 |
| Cobalt    | 6020A  | 604807          | 44.5   | 50.0       | 89    | 80-120           | 08/30/18 17:44 |
| Copper    | 6020A  | 604807          | 41.9 ✓ | 50.0       | 84 ✓  | 80-120           | 08/30/18 17:44 |
| Lead      | 6020A  | 604807          | 0.159  | -          | -     | -                | 08/30/18 17:44 |
| Manganese | 6020A  | 604807          | 45.6   | 50.0       | 91    | 80-120           | 08/30/18 17:44 |
| Nickel    | 6020A  | 604807          | 43.7   | 50.0       | 87    | 80-120           | 08/30/18 17:44 |
| Silver    | 6020A  | 604807          | 11.2   | 12.5       | 90    | 80-120           | 08/30/18 17:44 |
| Thallium  | 6020A  | 604807          | 0.013  | -          | -     | -                | 08/30/18 17:44 |
| Uranium   | 6020A  | 604807          | 0.007  | -          | -     | -                | 08/30/18 17:44 |
| Vanadium  | 6020A  | 604807          | 46.1   | 50.0       | 92    | 80-120           | 08/30/18 17:44 |
| Zinc      | 6020A  | 604807          | 21.1 ✓ | 25.0       | 84 ✓  | 80-120           | 08/30/18 17:44 |

# Interference Check Solution A (ICS-A) Report

Sample Name: ICSA  
 File Name: 010ICS.A.d  
 Data Path Name: D:\Agilent\ICPM\H1\DATA\BatchTemplate\Experiments\083018A5.b  
 Acq Time: 2018-08-30 5:41:30 PM  
 Sample Type: ICSA  
 Comment: ---  
 ISTD Ref FileName: 003CALB.d  
 Operator: ALKLS  
 NoUser

QC Analyte Table

| Name | Mass | ISTD | Tune Mode | Conc.      | Units | Conc. RSD | ExpValue | CPS     | QC Flag |
|------|------|------|-----------|------------|-------|-----------|----------|---------|---------|
| Be   | 9    | 6    | No Gas    | 0.0058     | ug/l  | 12.7      | -1       | 49      |         |
| Se   | 77   | 72   | H2        | 0.0688     | ug/l  | 28.0      | -1       | 31      |         |
| Se   | 78   | 72   | H2        | 0.0249     | ug/l  | 25.3      | -1       | 14      |         |
| Al   | 27   | 45   | He        | 20746.6394 | ug/l  | 0.6       | 20000    | 1553526 |         |
| V    | 51   | 72   | He        | 0.0354     | ug/l  | 7.1       | -1       | 102     |         |
| Cr   | 52   | 72   | He        | 1.1646     | ug/l  | 5.7       | -1       | 4962    |         |
| Cr   | 53   | 72   | He        | 1.1459     | ug/l  | 6.3       | -1       | 613     |         |
| Mn   | 55   | 72   | He        | 1.1379     | ug/l  | 3.3       | -1       | 1983    |         |
| Co   | 59   | 72   | He        | 1.1570     | ug/l  | 0.5       | -1       | 8019    |         |
| Ni   | 60   | 72   | He        | 1.4647     | ug/l  | 6.1       | -1       | 2867    |         |
| Ni   | 62   | 72   | He        | 1.3643     | ug/l  | 2.8       | -1       | 423     |         |
| Cu   | 63   | 72   | He        | 0.7556     | ug/l  | 2.0       | -1       | 4146    |         |
| Cu   | 65   | 72   | He        | 0.8136     | ug/l  | 2.4       | -1       | 2227    |         |
| Zn   | 66   | 72   | He        | 0.3848     | ug/l  | 9.4       | -1       | 297     |         |
| As   | 75   | 72   | He        | 0.2402     | ug/l  | 7.6       | -1       | 109     |         |
| Mo   | 95   | 115  | He        | 51.3304    | ug/l  | 0.6       | 50       | 117853  |         |
| Mo   | 98   | 115  | He        | 50.8424    | ug/l  | 1.8       | 50       | 201708  |         |
| Ag   | 107  | 115  | He        | 0.0099     | ug/l  | 5.1       | -1       | 99      |         |
| Ag   | 109  | 115  | He        | 0.0124     | ug/l  | 16.5      | -1       | 118     |         |
| Cd   | 111  | 115  | He        | 0.0300     | ug/l  | 16.7      | -1       | 33      |         |
| Cd   | 114  | 115  | He        | 0.0261     | ug/l  | 7.9       | -1       | 72      |         |
| Sb   | 121  | 115  | He        | 0.0920     | ug/l  | 10.9      | -1       | 204     |         |
| Sb   | 123  | 115  | He        | 0.0798     | ug/l  | 11.1      | -1       | 148     |         |
| Ba   | 137  | 115  | He        | 0.2687     | ug/l  | 12.1      | -1       | 186     |         |
| Tl   | 203  | 175  | He        | 0.0093     | ug/l  | 16.6      | -1       | 62      |         |
| Tl   | 205  | 175  | He        | 0.0109     | ug/l  | 21.8      | -1       | 168     |         |
| [Pb] | 206  | 175  | He        | 0.1519     | ug/l  | 16.5      | -1       | 749     |         |
| [Pb] | 207  | 175  | He        | 0.1471     | ug/l  | 11.1      | -1       | 652     |         |
| Pb   | 208  | 175  | He        | 0.1493     | ug/l  | 6.9       | -1       | 2991    |         |
| U    | 238  | 232  | He        | 0.0091     | ug/l  | 9.3       | -1       | 184     |         |

104 %

103 %

QC ISTD Table



# Interference Check Solution AB (ICS-AB) Report

Sample Name: ICSAB  
 File Name: 011ICSAB.d  
 Data Path Name: D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\083018A5.b  
 Acq Time: 2018-08-30 5:44:36 PM  
 Sample Type: ICSB  
 Comment: ---  
 ISTD Ref FileName: 003CALB.d  
 Operator: ALKLS  
 NoUser

QC Analyte Table

| Name | Mass | ISTD | Tune Mode | Conc.      | Units | Conc. RSD | ExpValue | CPS     | QC Flag |
|------|------|------|-----------|------------|-------|-----------|----------|---------|---------|
| Be   | 9    | 6    | No Gas    | 0.0053     | ug/l  | 18.1      | -1       | 47      |         |
| Se   | 77   | 72   | H2        | 23.5487    | ug/l  | 2.9       | 25       | 2936    |         |
| Se   | 78   | 72   | H2        | 23.8623    | ug/l  | 1.0       | 25       | 9421    |         |
| Al   | 27   | 45   | He        | 20739.8957 | ug/l  | 2.1       | 20000    | 1571819 |         |
| V    | 51   | 72   | He        | 46.0595    | ug/l  | 1.4       | 50       | 132682  |         |
| Cr   | 52   | 72   | He        | 45.6272    | ug/l  | 2.1       | 50       | 181316  |         |
| Cr   | 53   | 72   | He        | 45.9903    | ug/l  | 2.9       | 50       | 22527   |         |
| Mn   | 55   | 72   | He        | 45.6293    | ug/l  | 2.0       | 50       | 82461   |         |
| Co   | 59   | 72   | He        | 44.4736    | ug/l  | 1.8       | 50       | 320065  |         |
| Ni   | 60   | 72   | He        | 43.6924    | ug/l  | 2.1       | 50       | 88002   |         |
| Ni   | 62   | 72   | He        | 43.3206    | ug/l  | 2.8       | 50       | 13731   |         |
| Cu   | 63   | 72   | He        | 41.8186    | ug/l  | 2.2       | 50       | 236270  |         |
| Cu   | 65   | 72   | He        | 41.9205    | ug/l  | 2.4       | 50       | 117708  |         |
| Zn   | 66   | 72   | He        | 21.0941    | ug/l  | 3.0       | 25       | 16028   |         |
| As   | 75   | 72   | He        | 23.4871    | ug/l  | 2.3       | 25       | 9645    |         |
| Mo   | 95   | 115  | He        | 51.7636    | ug/l  | 0.8       | 50       | 119327  |         |
| Mo   | 98   | 115  | He        | 51.1543    | ug/l  | 0.6       | 50       | 203799  |         |
| Ag   | 107  | 115  | He        | 11.2343    | ug/l  | 1.0       | 12.5     | 96897   |         |
| Ag   | 109  | 115  | He        | 11.2462    | ug/l  | 0.6       | 12.5     | 92997   |         |
| Cd   | 111  | 115  | He        | 24.5374    | ug/l  | 0.9       | 25       | 26379   |         |
| Cd   | 114  | 115  | He        | 24.6469    | ug/l  | 1.3       | 25       | 64505   |         |
| Sb   | 121  | 115  | He        | 0.0906     | ug/l  | 11.9      | -1       | 202     |         |
| Sb   | 123  | 115  | He        | 0.0817     | ug/l  | 16.2      | -1       | 152     |         |
| Ba   | 137  | 115  | He        | 0.2700     | ug/l  | 5.5       | -1       | 188     |         |
| Tl   | 203  | 175  | He        | 0.0140     | ug/l  | 15.6      | -1       | 92      |         |
| Tl   | 205  | 175  | He        | 0.0134     | ug/l  | 13.7      | -1       | 206     |         |
| [Pb] | 206  | 175  | He        | 0.1672     | ug/l  | 5.8       | -1       | 830     |         |
| [Pb] | 207  | 175  | He        | 0.1618     | ug/l  | 5.5       | -1       | 721     |         |
| Pb   | 208  | 175  | He        | 0.1589     | ug/l  | 2.2       | -1       | 3202    |         |
| U    | 238  | 232  | He        | 0.0070     | ug/l  | 5.4       | -1       | 146     |         |

104%

104%

QC ISTD Table

ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A  
Sample Matrix: Fish Tissue

Service Request: K1807189  
Date Collected: N/A  
Date Received: N/A  
Date Analyzed: 08/30/18 - 08/31/18

Duplicate Matrix Spike Summary  
Total Metals

Sample Name: Batch QC  
Lab Code: K1807185-006  
Units: mg/Kg  
Basis: Dry

Teck  
sample

Matrix Spike  
KQ1811997-05

Duplicate Matrix Spike  
KQ1811997-06

| Analyte Name | Method | Sample Result | Result | Spike Amount | % Rec  | Result | Spike Amount | % Rec  | % Rec Limits | RPD | RPD Limit |
|--------------|--------|---------------|--------|--------------|--------|--------|--------------|--------|--------------|-----|-----------|
| Aluminum     | 6010C  | ND U          | 187    | 199          | 94     | 185    | 199          | 93     | 75-125       | 1   | 20        |
| Antimony     | 6020A  | ND U          | 49.1   | 49.8         | 99     | 49.2   | 49.7         | 99     | 75-125       | <1  | 20        |
| Arsenic      | 6020A  | 0.30 J        | 16.9   | 16.6         | 100    | 17.5   | 16.6         | 104    | 75-125       | 3   | 20        |
| Barium       | 6020A  | 0.305         | 95.7   | 99.7         | 96     | 96.1   | 99.3         | 96     | 75-125       | <1  | 20        |
| Beryllium    | 6020A  | ND U          | 4.86   | 4.98         | 97     | 4.85   | 4.97         | 98     | 75-125       | <1  | 20        |
| Cadmium      | 6020A  | 0.010 J       | 4.89   | 4.98         | 98     | 4.93   | 4.97         | 99     | 75-125       | <1  | 20        |
| Calcium      | 6010C  | 2120          | 1500   | 166          | -379 # | 1400   | 166          | -434 # | 75-125       | 7   | 20        |
| Chromium     | 6020A  | 0.58          | 19.4   | 19.9         | 95     | 19.7   | 19.9         | 96     | 75-125       | 2   | 20        |
| Cobalt       | 6020A  | 0.023         | 47.1   | 49.8         | 95     | 47.5   | 49.7         | 96     | 75-125       | <1  | 20        |
| Copper       | 6020A  | 1.76          | 24.5   | 24.9         | 91     | 24.7   | 24.8         | 92     | 75-125       | <1  | 20        |
| Iron         | 6010C  | 26.9          | 122    | 99.7         | 95     | 120    | 99.3         | 94     | 75-125       | 2   | 20        |
| Lead         | 6020A  | 0.011 J       | 46.9   | 49.8         | 94     | 47.6   | 49.7         | 96     | 75-125       | 1   | 20        |
| Magnesium    | 6010C  | 1450          | 1580   | 166          | 75 #   | 1570   | 166          | 71 #   | 75-125       | <1  | 20        |
| Manganese    | 6020A  | 1.81          | 47.5   | 49.8         | 92     | 48.4   | 49.7         | 94     | 75-125       | 2   | 20        |
| Nickel       | 6020A  | 0.28          | 47.3   | 49.8         | 94     | 47.5   | 49.7         | 95     | 75-125       | <1  | 20        |
| Potassium    | 6010C  | 20000         | 19900  | 166          | -70 #  | 19800  | 166          | -116 # | 75-125       | <1  | 20        |
| Selenium     | 7742   | 3.40          | 15.7   | 16.6         | 74 N   | 15.6   | 16.6         | 74 N   | 75-125       | <1  | 20        |
| Silver       | 6020A  | 0.005 J       | 5.51   | 4.98         | 111    | 5.60   | 4.97         | 113    | 75-125       | 2   | 20        |
| Sodium       | 6010C  | 2030          | 2160   | 166          | 81 #   | 2160   | 166          | 76 #   | 75-125       | <1  | 20        |
| Sulfur       | 6010C  | 9530          | 10400  | 997          | 83 #   | 10300  | 993          | 75 #   | 75-125       | <1  | 20        |
| Thallium     | 6020A  | 0.057         | 3.30   | 3.32         | 98     | 3.40   | 3.31         | 101    | 75-125       | 3   | 20        |
| Uranium      | 6020A  | ND U          | 3.24   | 3.32         | 98     | 3.33   | 3.31         | 101    | 75-125       | 3   | 20        |
| Vanadium     | 6020A  | ND U          | 47.6   | 49.8         | 96     | 48.7   | 49.7         | 98     | 75-125       | 2   | 20        |
| Zinc         | 6020A  | 23.2          | 67.5   | 49.8         | 89     | 68.8   | 49.7         | 92     | 75-125       | 2   | 20        |

J- Se in all

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Printed 9/25/2018 12:49:22 PM

Superset Reference:

ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807189

POST SPIKE SAMPLE RECOVERY

Concentration Units: ug/L

| Sample ID     | Analyte            | Method | Analysis Batch: | Initial Sample Result | Post Spike Result | True Value | % Rec | % Rec. Limits | Analysis Date  |
|---------------|--------------------|--------|-----------------|-----------------------|-------------------|------------|-------|---------------|----------------|
| K1807185-006A | <i>Teck sample</i> |        |                 |                       |                   |            |       |               |                |
|               | Antimony           | 6020A  | 604807          | 0.005 U               | 48.2              | 50.0       | 96    | 80-120        | 08/30/18 18:09 |
|               | Arsenic            | 6020A  | 604807          | 0.6 J                 | 50.0              | 50.0       | 99    | 80-120        | 08/30/18 18:09 |
|               | Barium             | 6020A  | 604807          | 0.61                  | 48.6              | 50.0       | 96    | 80-120        | 08/30/18 18:09 |
|               | Beryllium          | 6020A  | 604807          | 0.008 U               | 48.6              | 50.0       | 97    | 80-120        | 08/30/18 18:09 |
|               | Cadmium            | 6020A  | 604807          | 0.02 J                | 48.3              | 50.0       | 97    | 80-120        | 08/30/18 18:09 |
|               | Chromium           | 6020A  | 604807          | 1.2                   | 47.9              | 50.0       | 93    | 80-120        | 08/30/18 18:09 |
|               | Cobalt             | 6020A  | 604807          | 0.05                  | 46.6              | 50.0       | 93    | 80-120        | 08/30/18 18:09 |
|               | Copper             | 6020A  | 604807          | 3.5                   | 49.6              | 50.0       | 92    | 80-120        | 08/30/18 18:09 |
|               | Lead               | 6020A  | 604807          | 0.02 J                | 46.4              | 50.0       | 93    | 80-120        | 08/30/18 18:09 |
|               | Manganese          | 6020A  | 604807          | 3.61                  | 50.1              | 50.0       | 93    | 80-120        | 08/30/18 18:09 |
|               | Nickel             | 6020A  | 604807          | 0.6                   | 46.7              | 50.0       | 92    | 80-120        | 08/30/18 18:09 |
|               | Silver             | 6020A  | 604807          | 0.009 J               | 9.44              | 10.0       | 94    | 80-120        | 08/30/18 18:09 |
|               | Thallium           | 6020A  | 604807          | 0.11                  | 47.0              | 50.0       | 94    | 80-120        | 08/30/18 18:09 |
|               | Uranium            | 6020A  | 604807          | 0.002 U               | 47.0              | 50.0       | 94    | 80-120        | 08/30/18 18:09 |
|               | Vanadium           | 6020A  | 604807          | 0.02 U                | 47.1              | 50.0       | 94    | 80-120        | 08/30/18 18:09 |
|               | Zinc               | 6020A  | 604807          | 46.5                  | 91.8              | 50.0       | 91    | 80-120        | 08/30/18 18:09 |

Results flagged with a pound (#) indicate the control criteria is not applicable.

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish tissue

**Service Request:** K1807189  
**Date Collected:** 07/26/18  
**Date Received:** 07/28/18  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30-31/18

Triplicate Summary  
Total Metals

**Sample Name:** EPA-NP-B1 ✓  
**Lab Code:** KQ1811997-09  
**Test Notes:**

**Units:** mg/Kg  
**Basis:** Dry

| Analyte   | Analysis Method | MRL  | Sample Result | Duplicate Sample Result | Triplicate Sample Result | Average | Relative Standard Deviation | Result Notes |
|-----------|-----------------|------|---------------|-------------------------|--------------------------|---------|-----------------------------|--------------|
|           |                 |      |               |                         |                          |         |                             |              |
| Aluminum  | 6010C           | 1.0  | ND U          | 0.4 J ✓                 | 0.5 J                    | NC      | NC                          |              |
| Antimony  | 6020A           | 0.05 | ND U          | ND U                    | ND U                     | ND      | -                           |              |
| Arsenic   | 6020A           | 0.5  | 0.42 J        | 0.41 J                  | 0.42 J ✓                 | 0.42    | 1.7 ✓                       |              |
| Barium    | 6020A           | 0.05 | 0.165         | 0.162 ✓                 | 0.234                    | 0.187   | 21.8                        | #            |
| Beryllium | 6020A           | 0.02 | ND U          | ND U                    | ND U                     | ND      | -                           |              |
| Cadmium   | 6020A           | 0.02 | 0.004 J       | 0.004 J                 | 0.003 J                  | 0.004   | 15.7                        |              |
| Calcium   | 6010C           | 4.0  | 730           | 1120                    | 1340 ✓                   | 1060    | 29.1                        | *            |
| Chromium  | 6020A           | 0.2  | 0.26          | 0.26                    | 0.28                     | 0.27    | 4.3                         |              |
| Cobalt    | 6020A           | 0.02 | 0.014 J       | 0.011 J                 | 0.014 J ✓                | 0.013   | 13.3                        |              |
| Copper    | 6020A           | 0.1  | 1.27          | 1.34                    | 1.30                     | 1.30    | 2.7                         |              |
| Iron      | 6010C           | 8    | 9.4           | 10.1 ✓                  | 10.0                     | 9.8     | 3.9 ✓                       |              |
| Lead      | 6020A           | 0.02 | 0.008 J       | 0.007 J                 | 0.008 J                  | 0.008   | 7.5                         |              |
| Magnesium | 6010C           | 1.0  | 1350          | 1370                    | 1360                     | 1360    | 0.7                         |              |
| Manganese | 6020A           | 0.05 | 1.04          | 1.15 ✓                  | 1.31                     | 1.17    | 11.6                        |              |
| Nickel    | 6020A           | 0.2  | 0.15 J        | 0.14 J                  | 0.14 J                   | 0.14    | 4.0                         |              |
| Potassium | 6010C           | 40   | 19200         | 19500                   | 19300 ✓                  | 19300   | 0.8                         |              |
| Selenium  | 7742            | 0.1  | 3.40          | 3.74 ✓                  | 3.38 ✓                   | 3.51    | 5.8 ✓                       |              |
| Silver    | 6020A           | 0.02 | ND U          | 0.002 J                 | ND U                     | NC      | NC                          |              |
| Sodium    | 6010C           | 20   | 1500          | 1510                    | 1500 ✓                   | 1500    | 0.4                         |              |
| Sulfur    | 6010C           | 8.0  | 9370          | 9440 ✓                  | 9360                     | 9390    | 0.5 ✓                       |              |
| Thallium  | 6020A           | 0.02 | 0.043         | 0.044                   | 0.047 ✓                  | 0.045   | 4.7                         |              |
| Uranium   | 6020A           | 0.02 | ND U          | ND U                    | ND U                     | ND      | -                           |              |
| Vanadium  | 6020A           | 0.2  | ND U          | ND U                    | ND U                     | ND      | -                           |              |
| Zinc      | 6020A           | 0.5  | 20.3          | 20.6 ✓                  | 21.3                     | 20.7    | 2.5                         |              |

≤ 30 ✓

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish Tissue

**Service Request:** K1807189  
**Date Analyzed:** 08/30/18

**Lab Control Sample Summary**  
**Total Metals**

**Units:**mg/Kg

**Basis:**Dry

**Lab Control Sample**  
KQ1811997-02

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|--------------|-------------------|--------|--------------|-------|--------------|
| Aluminum     | 6010C             | 193 ✓  | 200          | 97 ✓  | 80-120 ✓     |
| Calcium      | 6010C             | 169    | 167          | 101   | 80-120       |
| Iron         | 6010C             | 99.7   | 100          | 100   | 80-120       |
| Magnesium    | 6010C             | 169    | 167          | 101   | 80-120       |
| Potassium    | 6010C             | 177 ✓  | 167          | 106 ✓ | 80-120       |
| Sodium       | 6010C             | 164    | 167          | 98    | 80-120       |
| Sulfur       | 6010C             | 960    | 1000         | 96    | 80-120       |



ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish Tissue

**Service Request:** K1807189  
**Date Analyzed:** 08/30/18

**Lab Control Sample Summary**  
**Total Metals**

**Units:**mg/Kg  
**Basis:**Dry

**Lab Control Sample**  
KQ1811997-02

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|--------------|-------------------|--------|--------------|-------|--------------|
| Antimony     | 6020A             | 48.4   | 50.0         | 97    | 80-120 ✓     |
| Arsenic      | 6020A             | 16.4   | 16.7         | 99    | 80-120       |
| Barium       | 6020A             | 96.6 ✓ | 100          | 97 ✓  | 80-120       |
| Beryllium    | 6020A             | 4.85   | 5.00         | 97    | 80-120       |
| Cadmium      | 6020A             | 4.81   | 5.00         | 96    | 80-120       |
| Chromium     | 6020A             | 19.2   | 20.0         | 96    | 80-120       |
| Cobalt       | 6020A             | 47.8   | 50.0         | 96    | 80-120       |
| Copper       | 6020A             | 23.7   | 25.0         | 95    | 80-120       |
| Lead         | 6020A             | 47.8 ✓ | 50.0         | 96 ✓  | 80-120       |
| Manganese    | 6020A             | 47.5   | 50.0         | 95    | 80-120       |
| Nickel       | 6020A             | 47.6   | 50.0         | 95    | 80-120       |
| Silver       | 6020A             | 5.62   | 5.00         | 112   | 80-120       |
| Thallium     | 6020A             | 3.32   | 3.33         | 100   | 80-120       |
| Uranium      | 6020A             | 3.15 ✓ | 3.33         | 95 ✓  | 80-120       |
| Vanadium     | 6020A             | 47.8   | 50.0         | 96    | 80-120       |
| Zinc         | 6020A             | 45.9   | 50.0         | 92    | 80-120       |

ALS Group USA, Corp.  
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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish Tissue

**Service Request:** K1807189  
**Date Analyzed:** 08/31/18

**Lab Control Sample Summary**

**Total Metals**

**Units:**mg/Kg

**Basis:**Dry

**Lab Control Sample**

KQ1811997-02

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|--------------|-------------------|--------|--------------|-------|--------------|
| Selenium     | 7742              | 15.8 ✓ | 16.7         | 95 ✓  | 80-120       |

**ALS Group USA, Corp.**  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**LCS Matrix:** Tissue

**Service Request:** K1807189  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30-31/18

Standard Reference Material Summary  
Total Metals

**Sample Name:** Standard Reference Material  
**Lab Code:** KQ1811997-03 ✓  
**Test Notes:** Dorm-4 Solids = 94.5%

**Units:** mg/Kg (ppm)  
**Basis:** Dry

**Source:** N.R.C.C. Dorm-4

| Analyte  | Prep Method | Analysis Method | True Value | Result | Percent Recovery | Control Limits ✓ | Result Notes |
|----------|-------------|-----------------|------------|--------|------------------|------------------|--------------|
| Arsenic  | PSEP Tissue | 6020A           | 6.8        | 7.0 ✓  | 103 ✓            | 4.93-8.93        |              |
| Cadmium  | PSEP Tissue | 6020A           | 0.306      | 0.306  | 100              | 0.233 - 0.385    |              |
| Chromium | PSEP Tissue | 6020A           | 1.87       | 1.78   | 95               | 1.37-2.44        |              |
| Copper   | PSEP Tissue | 6020A           | 15.9       | 15.0   | 94               | 12.0 - 20.2      |              |
| Iron     | PSEP Tissue | 6010C           | 341        | 338 ✓  | 99 ✓             | 251-442          |              |
| Lead     | PSEP Tissue | 6020A           | 0.416      | 0.372  | 89               | 0.290 - 0.563    |              |
| Nickel   | PSEP Tissue | 6020A           | 1.36       | 1.38   | 101              | 0.912-1.9        |              |
| Selenium | PSEP Tissue | 7742            | 3.56       | 3.78 ✓ | 106 ✓            | 2.58 - 4.68      |              |
| Zinc     | PSEP Tissue | 6020A           | 52.20      | 49.9   | 96               | 39.2 - 66.5      |              |

**ALS Group USA, Corp.**  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**LCS Matrix:** Tissue

**Service Request:** K1807189  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30-31/18

Standard Reference Material Summary  
Total Metals

**Sample Name:** Standard Reference Material  
**Lab Code:** KQ1811997-04 ✓  
**Test Notes:** Tort-3 Solids = 99.1%

**Units:** mg/Kg (ppm)  
**Basis:** Dry

**Source:** N.R.C.C. Tort-3

| Analyte   | Prep Method | Analysis Method | True Value | Result | Percent Recovery | Control Limits ✓ | Result Notes |
|-----------|-------------|-----------------|------------|--------|------------------|------------------|--------------|
| Arsenic   | PSEP Tissue | 6020A           | 59.5       | 63.7   | 107              | 44.6-76.0        |              |
| Cadmium   | PSEP Tissue | 6020A           | 42.3       | 40.5   | 96               | 32.4-52.9        |              |
| Chromium  | PSEP Tissue | 6020A           | 1.95       | 1.66 ✓ | 85 ✓             | 1.37-2.63        |              |
| Copper    | PSEP Tissue | 6020A           | 497        | 460    | 93               | 380-623          |              |
| Iron      | PSEP Tissue | 6010C           | 179        | 165 ✓  | 92 ✓             | 137-224          |              |
| Lead      | PSEP Tissue | 6020A           | 0.225      | 0.188  | 84               | 0.166-0.292      |              |
| Manganese | PSEP Tissue | 6020A           | 15.6       | 13.7   | 88               | 11.7-19.9        |              |
| Nickel    | PSEP Tissue | 6020A           | 5.3        | 4.7 ✓  | 89 ✓             | 4.05-6.65        |              |
| Selenium  | PSEP Tissue | 7742            | 10.9       | 11.2 ✓ | 110 ✓            | 7.9-14.3         |              |
| Vanadium  | PSEP Tissue | 6020A           | 9.1        | 8.4    | 92               | 7.0-11.4         |              |
| Zinc      | PSEP Tissue | 6020A           | 136        | 120 ✓  | 88 ✓             | 104-170          |              |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807189

ICP SERIAL DILUTIONS

Concentration Units: ug/L

| Sample ID       | Analyte   | Method | Analysis Batch: | Initial Sample Result | Serial Dillution Result | % Diff | % Diff. Limit | Analysis Date  |
|-----------------|-----------|--------|-----------------|-----------------------|-------------------------|--------|---------------|----------------|
| K1807185-006SDL |           |        |                 |                       |                         |        |               |                |
|                 | Aluminum  | 6010C  | 604833          | 2                     | 27 J                    | 1588   | 10            | 08/30/18 16:03 |
|                 | Calcium   | 6010C  | 604833          | 21200                 | 21900                   | 3      | 10            | 08/30/18 16:03 |
|                 | Iron      | 6010C  | 604833          | 270                   | 370 J                   | 39     | 10            | 08/30/18 16:03 |
|                 | Magnesium | 6010C  | 604833          | 14500                 | 14200                   | 2      | 10            | 08/30/18 16:03 |
|                 | Potassium | 6010C  | 604833          | 200000                | 192000                  | 4      | 10            | 08/30/18 16:03 |
|                 | Sodium    | 6010C  | 604833          | 20300                 | 19400                   | 4      | 10            | 08/30/18 16:03 |
|                 | Sulfur    | 6010C  | 604833          | 95300                 | 92900                   | 2      | 10            | 08/30/18 16:03 |
| K1807185-006SDL |           |        |                 |                       |                         |        |               |                |
|                 | Antimony  | 6020A  | 604807          | 0.005 U               | 2.1 J                   | 6818   | 10            | 08/30/18 18:06 |
|                 | Arsenic   | 6020A  | 604807          | 3                     | 26                      | 772    | 10            | 08/30/18 18:06 |
|                 | Barium    | 6020A  | 604807          | 3.0                   | 3.5                     | 14     | 10            | 08/30/18 18:06 |
|                 | Beryllium | 6020A  | 604807          | 0.008 U               | 0.02 U                  | -421   | 10            | 08/30/18 18:06 |
|                 | Cadmium   | 6020A  | 604807          | 0.10                  | 0.2 J                   | 121    | 10            | 08/30/18 18:06 |
|                 | Chromium  | 6020A  | 604807          | 6                     | 5 J                     | 22     | 10            | 08/30/18 18:06 |
|                 | Cobalt    | 6020A  | 604807          | 0.2                   | 0.3 J                   | 21     | 10            | 08/30/18 18:06 |
|                 | Copper    | 6020A  | 604807          | 17.6                  | 25.1                    | 43     | 10            | 08/30/18 18:06 |
|                 | Lead      | 6020A  | 604807          | 0.1                   | 0.4 J                   | 213    | 10            | 08/30/18 18:06 |
|                 | Manganese | 6020A  | 604807          | 18.1                  | 20.0                    | 11     | 10            | 08/30/18 18:06 |
|                 | Nickel    | 6020A  | 604807          | 3                     | 4 J                     | 29     | 10            | 08/30/18 18:06 |
|                 | Silver    | 6020A  | 604807          | 0.05                  | 0.6 J                   | 1212   | 10            | 08/30/18 18:06 |
|                 | Thallium  | 6020A  | 604807          | 0.6                   | 0.8 J                   | 35     | 10            | 08/30/18 18:06 |
|                 | Uranium   | 6020A  | 604807          | 0.002 U               | 0.03 U                  | 686    | 10            | 08/30/18 18:06 |
|                 | Vanadium  | 6020A  | 604807          | 0.02 U                | 6 J                     | 5383   | 10            | 08/30/18 18:06 |
|                 | Zinc      | 6020A  | 604807          | 232                   | 267                     | 15     | 10            | 08/30/18 18:06 |

all 6020 exc. Cu, Mn, Zn  
met < 50% DL

J Cu, Mn, Zn in all

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807189

**Detection Limits**

**Instrument:** K-ICP-AES-04

**Matrix:** Fish Tissue

| Analyte   | Wavelength<br>(nm) | Units | MRL | MDL | Method |
|-----------|--------------------|-------|-----|-----|--------|
| Aluminum  | 1670               | ug/L  | 10  | 3   | 6010C  |
| Calcium   | 3933               | ug/L  | 40  | 20  | 6010C  |
| Iron      | 2599               | ug/L  | 80  | 10  | 6010C  |
| Magnesium | 2852               | ug/L  | 10  | 6   | 6010C  |
| Potassium | 7664               | ug/L  | 400 | 90  | 6010C  |
| Sodium    | 5895               | ug/L  | 200 | 20  | 6010C  |
| Sulfur    | 1820               | ug/L  | 80  | 10  | 6010C  |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807189

**Detection Limits**

**Instrument:** K-ICP-MS-06

**Matrix:** Fish Tissue

| Analyte   | Mass | Units | MRL  | MDL   | Method |
|-----------|------|-------|------|-------|--------|
| Antimony  | 121  | ug/L  | 0.1  | 0.01  | 6020A  |
| Arsenic   | 75   | ug/L  | 1    | 0.04  | 6020A  |
| Barium    | 137  | ug/L  | 0.1  | 0.04  | 6020A  |
| Beryllium | 9    | ug/L  | 0.04 | 0.016 | 6020A  |
| Cadmium   | 111  | ug/L  | 0.04 | 0.006 | 6020A  |
| Chromium  | 52   | ug/L  | 0.4  | 0.04  | 6020A  |
| Cobalt    | 59   | ug/L  | 0.04 | 0.006 | 6020A  |
| Copper    | 65   | ug/L  | 0.2  | 0.06  | 6020A  |
| Lead      | 208  | ug/L  | 0.04 | 0.006 | 6020A  |
| Manganese | 55   | ug/L  | 0.1  | 0.02  | 6020A  |
| Nickel    | 60   | ug/L  | 0.4  | 0.04  | 6020A  |
| Silver    | 107  | ug/L  | 0.04 | 0.004 | 6020A  |
| Thallium  | 205  | ug/L  | 0.04 | 0.004 | 6020A  |
| Uranium   | 238  | ug/L  | 0.04 | 0.004 | 6020A  |
| Vanadium  | 51   | ug/L  | 0.4  | 0.04  | 6020A  |
| Zinc      | 66   | ug/L  | 1    | 0.16  | 6020A  |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807189

**Detection Limits**

**Instrument:** K-FLAA-02

**Matrix:** Fish Tissue

| <b>Analyte</b> | <b>Wavelength<br/>(nm)</b> | <b>Units</b> | <b>MRL</b> | <b>MDL</b> | <b>Method</b> |
|----------------|----------------------------|--------------|------------|------------|---------------|
| Selenium       | 196.0                      | ug/L         | 0.2        | 0.1        | 7742          |



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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807189

**ICP Linear Range (Quarterly)**

**Instrument:** K-ICP-AES-04

| Analyte        | Concentration (ug/L) | Method |
|----------------|----------------------|--------|
| Aluminum 1670  | 2000                 | 6010C  |
| Aluminum 3944  | 270000               | 6010C  |
| Calcium 3158   | 450000               | 6010C  |
| Calcium 3933   | 8000                 | 6010C  |
| Iron 2599      | 360000               | 6010C  |
| Magnesium 2790 | 450000               | 6010C  |
| Magnesium 2795 | 8000                 | 6010C  |
| Magnesium 2852 | 90000                | 6010C  |
| Potassium 7664 | 450000               | 6010C  |
| Sodium 5895    | 450000               | 6010C  |
| Sulfur 1820    | 450000               | 6010C  |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807189

**ICP Linear Range (Quarterly)**

**Instrument:** K-ICP-MS-06

| Analyte      | Concentration (ug/L) | Method |
|--------------|----------------------|--------|
| Antimony 121 | 4500                 | 6020A  |
| Arsenic 75   | 4500                 | 6020A  |
| Barium 137   | 9000                 | 6020A  |
| Beryllium 9  | 9000                 | 6020A  |
| Cadmium 111  | 9000                 | 6020A  |
| Chromium 52  | 9000                 | 6020A  |
| Cobalt 59    | 9000                 | 6020A  |
| Copper 65    | 4500                 | 6020A  |
| Lead 208     | 2700                 | 6020A  |
| Manganese 55 | 9000                 | 6020A  |
| Nickel 60    | 4500                 | 6020A  |
| Silver 107   | 900                  | 6020A  |
| Thallium 205 | 2700                 | 6020A  |
| Uranium 238  | 9000                 | 6020A  |
| Vanadium 51  | 9000                 | 6020A  |
| Zinc 66      | 9000                 | 6020A  |

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Prep Summary Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish Tissue

**Service Request:** K1807189

**Metals**

**Prep Method:** PSEP Metals  
**Analytical Method:** 6010C/6020A

**Extraction Lot:** 320955  
**Extraction Date:** 08/29/18 19:30 ✓

| Sample Name                 | Lab Code        | Date Collected | Date Received | Sample Amount ✓ | Final Amount ✓ | Percent Solids |
|-----------------------------|-----------------|----------------|---------------|-----------------|----------------|----------------|
| EPA-NP-B1                   | K1807189-006    | 7/26/18        | 7/28/18       | 0.302 g         | 30 mL          |                |
| EPA-NP-B2                   | K1807189-012    | 7/26/18        | 7/28/18       | 0.300 g         | 30 mL          |                |
| EPA-NP-B3                   | K1807189-018    | 7/25/18        | 7/28/18       | 0.300 g         | 30 mL          |                |
| EPA-NP-B4                   | K1807189-024    | 7/26/18        | 7/28/18       | 0.301 g         | 30 mL          |                |
| EPA-NP-B5                   | K1807189-030    | 7/26/18        | 7/28/18       | 0.301 g         | 30 mL          |                |
| EPA-NP-B6                   | K1807189-036    | 7/26/18        | 7/28/18       | 0.301 g         | 30 mL          |                |
| Method Blank                | KQ1811997-01MB  | NA             | NA            | 0.300 g         | 30 mL          |                |
| Lab Control Sample          | KQ1811997-02LCS | NA             | NA            | 0.300 g         | 30 mL          |                |
| Matrix Spike                | KQ1811997-05MS  | NA             | NA            | 0.301 g         | 30 mL          |                |
| Duplicate Matrix Spike      | KQ1811997-06DMS | NA             | NA            | 0.302 g         | 30 mL          |                |
| Duplicate                   | KQ1811997-08DUP | 7/26/18        | 7/28/18       | 0.300 g         | 30 mL          |                |
| Triplicate                  | KQ1811997-09TRP | 7/26/18        | 7/28/18       | 0.301 g         | 30 mL          |                |
| Standard Reference Material | KQ1811997-03SRM | NA             | NA            | 0.302 g         | 30 mL          |                |
| Standard Reference Material | KQ1811997-04SRM | NA             | NA            | 0.301 g         | 30 mL          |                |

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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807189

Analysis Run Log

Instrument ID: K-ICP-AES-04

Analytical BatchID: 604833

| Sample              | Dilution Factor | Date/Time      | A<br>l | C<br>a | F<br>e | M<br>g | K | N | S |
|---------------------|-----------------|----------------|--------|--------|--------|--------|---|---|---|
| ZZZZZZ              | 1               | 08/30/18 14:35 |        |        |        |        |   |   |   |
| ZZZZZZ              | 1               | 08/30/18 14:37 |        |        |        |        |   |   |   |
| ZZZZZZ              | 1               | 08/30/18 14:39 |        |        |        |        |   |   |   |
| ICVB                | 1               | 08/30/18 14:42 | X      | X      |        | X      |   |   | X |
| ICV                 | 1               | 08/30/18 14:44 | X      | X      | X      | X      | X | X |   |
| ICB                 | 1               | 08/30/18 14:46 | X      | X      | X      | X      | X | X | X |
| LLICV               | 1               | 08/30/18 14:49 | X      | X      |        | X      | X | X |   |
| LLICV               | 0.5             | 08/30/18 14:51 |        |        | X      |        |   |   | X |
| CCVB1               | 1               | 08/30/18 14:54 | X      | X      | X      | X      | X | X | X |
| CCVA1               | 1               | 08/30/18 14:56 | X      | X      |        | X      |   |   |   |
| ZZZZZZ              | 1               | 08/30/18 14:59 |        |        |        |        |   |   |   |
| CCB                 | 1               | 08/30/18 15:29 | X      | X      | X      | X      | X | X | X |
| ICSA                | 1               | 08/30/18 15:34 |        |        | X      |        | X | X | X |
| ICSAB               | 1               | 08/30/18 15:36 |        |        | X      |        | X | X | X |
| KQ1811997-01MB      | 1               | 08/30/18 15:51 | X      | X      | X      | X      | X | X | X |
| KQ1811997-02LCS     | 1               | 08/30/18 15:54 | X      | X      | X      | X      | X | X | X |
| ZZZZZZ-03 SRM       | 1               | 08/30/18 15:56 |        |        |        |        |   |   |   |
| ZZZZZZ-04 SRM       | 1               | 08/30/18 15:58 |        |        |        |        |   |   |   |
| ZZZZZZ              | 1               | 08/30/18 16:01 |        |        |        |        |   |   |   |
| K1807185-006SDL     | 5               | 08/30/18 16:03 | X      | X      | X      | X      | X | X | X |
| KQ1811997-02LCS     | 1               | 08/30/18 16:05 | X      | X      | X      | X      | X | X | X |
| K1807185-006MS      | 1               | 08/30/18 16:08 | X      | X      | X      | X      | X | X | X |
| K1807185-006DMS     | 1               | 08/30/18 16:10 | X      | X      | X      | X      | X | X | X |
| ZZZZZZ              | 1               | 08/30/18 16:12 |        |        |        |        |   |   |   |
| CCVB                | 1               | 08/30/18 16:15 | X      | X      | X      | X      | X | X | X |
| ZZZZZZ              | 1               | 08/30/18 16:17 |        |        |        |        |   |   |   |
| CCVA                | 1               | 08/30/18 16:19 | X      | X      |        | X      |   |   |   |
| CCB                 | 1               | 08/30/18 16:22 | X      | X      | X      | X      | X | X | X |
| ZZZZZZ              | 1               | 08/30/18 16:25 |        |        |        |        |   |   |   |
| ZZZZZZ              | 1               | 08/30/18 16:27 |        |        |        |        |   |   |   |
| ZZZZZZ              | 1               | 08/30/18 16:30 |        |        |        |        |   |   |   |
| ZZZZZZ              | 1               | 08/30/18 16:32 |        |        |        |        |   |   |   |
| K1807189-006        | 1               | 08/30/18 16:34 | X      | X      | X      | X      | X | X | X |
| K1807189-006DUP     | 1               | 08/30/18 16:37 | X      | X      | X      | X      | X | X | X |
| K1807189-006DUP-TRP | 1               | 08/30/18 16:39 | X      | X      | X      | X      | X | X | X |
| K1807189-012        | 1               | 08/30/18 16:41 | X      | X      | X      | X      | X | X | X |
| K1807189-018        | 1               | 08/30/18 16:44 | X      | X      | X      | X      | X | X | X |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A

**Service Request:** K1807189

**Analysis Run Log**

**Instrument ID:** K-ICP-AES-04

**Analytical BatchID:** 604833

| Sample       | Dilution Factor | Date/Time      | A<br>l | C<br>a | F<br>e | M<br>g | K | N<br>a | S |
|--------------|-----------------|----------------|--------|--------|--------|--------|---|--------|---|
| K1807189-024 | 1               | 08/30/18 16:46 | X      | X      | X      | X      | X | X      | X |
| CCVB         | 1               | 08/30/18 16:48 | X      | X      | X      | X      | X | X      | X |
| CCVA         | 1               | 08/30/18 16:51 | X      | X      |        | X      |   |        |   |
| CCB          | 1               | 08/30/18 16:54 | X      | X      | X      | X      | X | X      | X |
| K1807189-030 | 1               | 08/30/18 16:57 | X      | X      | X      | X      | X | X      | X |
| K1807189-036 | 1               | 08/30/18 16:59 | X      | X      | X      | X      | X | X      | X |
| CCVB         | 1               | 08/30/18 17:01 | X      | X      | X      | X      | X | X      | X |
| CCVA         | 1               | 08/30/18 17:04 | X      | X      |        | X      |   |        |   |
| CCB          | 1               | 08/30/18 17:06 | X      | X      | X      | X      | X | X      | X |
| LLCCV        | 1               | 08/30/18 17:09 | X      | X      |        | X      |   | X      |   |
| ZZZZZZ       | 0.5             | 08/30/18 17:11 |        |        |        |        |   |        |   |
| LLCCV        | 0.5             | 08/30/18 17:14 |        |        |        |        | X |        | X |
| LLCCV 4X     | 1               | 08/30/18 17:20 |        |        | X      |        |   |        |   |

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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807189

Analysis Run Log

Instrument ID: K-ICP-MS-06

Analytical BatchID: 604807

| Sample          | Dilution Factor | Date/Time      | S | A | B | B | C | C | C | P | M | N | A | T | U | V | Z |
|-----------------|-----------------|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|                 |                 |                | b | s | a | e | d | r | o | u | b | n | i | g | l |   | n |
| ZZZZZZ          | 1               | 08/30/18 17:19 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| ZZZZZZ          | 1               | 08/30/18 17:22 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| ICV             | 1               | 08/30/18 17:25 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CCV             | 1               | 08/30/18 17:29 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| ICB             | 1               | 08/30/18 17:32 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CCB             | 1               | 08/30/18 17:35 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| LLICVT          | 1               | 08/30/18 17:38 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| ICSA            | 1               | 08/30/18 17:41 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| ICSAB           | 1               | 08/30/18 17:44 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| ZZZZZZ          | 1               | 08/30/18 17:47 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| KQ1811997-01MB  | 5               | 08/30/18 17:50 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| KQ1811997-02LCS | 5               | 08/30/18 17:53 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| ZZZZZZ -03 SRM  | 5               | 08/30/18 17:57 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| ZZZZZZ -04 SRM  | 5               | 08/30/18 18:00 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| ZZZZZZ          | 5               | 08/30/18 18:03 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| K1807185-006SDL | 25              | 08/30/18 18:06 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807185-006PS  | 5               | 08/30/18 18:09 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807185-006MS  | 5               | 08/30/18 18:12 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807185-006DMS | 5               | 08/30/18 18:16 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CCV             | 1               | 08/30/18 18:19 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CCB             | 1               | 08/30/18 18:22 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| ZZZZZZ          | 5               | 08/30/18 18:25 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| ZZZZZZ          | 5               | 08/30/18 18:28 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| ZZZZZZ          | 5               | 08/30/18 18:31 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| ZZZZZZ          | 5               | 08/30/18 18:34 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| ZZZZZZ          | 5               | 08/30/18 18:37 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| K1807189-006    | 5               | 08/30/18 18:41 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807189-006DUP | 5               | 08/30/18 18:44 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807189-006TRP | 5               | 08/30/18 18:47 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807189-012    | 5               | 08/30/18 18:50 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807189-018    | 5               | 08/30/18 18:53 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CCV             | 1               | 08/30/18 18:56 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CCB             | 1               | 08/30/18 18:59 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807189-024    | 5               | 08/30/18 19:02 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807189-030    | 5               | 08/30/18 19:06 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| K1807189-036    | 5               | 08/30/18 19:09 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CCV             | 1               | 08/30/18 19:12 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807189

Analysis Run Log

Instrument ID: K-ICP-MS-06

Analytical BatchID: 604807

| Sample | Dilution<br>Factor | Date/Time      | S<br>b | A<br>s | B<br>a | B<br>e | C<br>d | C<br>r | C<br>o | C<br>u | P<br>b | M<br>n | N<br>i | A<br>l | T<br>l | U | V | Z<br>n |
|--------|--------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---|---|--------|
| CCB    | 1                  | 08/30/18 19:15 | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X | X | X      |
| LLCCVT | 1                  | 08/30/18 19:18 | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X | X | X      |

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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807189

Analysis Run Log

Instrument ID: K-FLAA-02

Analytical BatchID: 605054

| Sample          | Dilution Factor | Date/Time      | S e |
|-----------------|-----------------|----------------|-----|
| ZZZZZZ          | 1               | 08/31/18 11:04 |     |
| ZZZZZZ          | 1               | 08/31/18 11:06 |     |
| ZZZZZZ          | 1               | 08/31/18 11:09 |     |
| ZZZZZZ          | 1               | 08/31/18 11:11 |     |
| ZZZZZZ          | 1               | 08/31/18 11:13 |     |
| ZZZZZZ          | 1               | 08/31/18 11:16 |     |
| ZZZZZZ          | 1               | 08/31/18 11:18 |     |
| ICV             | 1               | 08/31/18 11:21 | X   |
| ICB             | 1               | 08/31/18 11:23 | X   |
| LLICV 0.2ppb    | 1               | 08/31/18 11:25 | X   |
| CCV             | 1               | 08/31/18 11:27 | X   |
| CCB             | 1               | 08/31/18 11:30 | X   |
| KQ1811997-01MB  | 5               | 08/31/18 11:32 | X   |
| KQ1811997-02LCS | 50              | 08/31/18 11:34 | X   |
| ZZZZZZ -03 SRM  | 10              | 08/31/18 11:37 |     |
| ZZZZZZ          | 10              | 08/31/18 11:39 |     |
| ZZZZZZ          | 50              | 08/31/18 11:41 |     |
| ZZZZZZ          | 50              | 08/31/18 11:44 |     |
| ZZZZZZ          | 5               | 08/31/18 11:46 |     |
| ZZZZZZ          | 5               | 08/31/18 11:48 |     |
| ZZZZZZ          | 50              | 08/31/18 11:51 |     |
| ZZZZZZ          | 50              | 08/31/18 11:53 |     |
| CCV             | 1               | 08/31/18 11:55 | X   |
| CCB             | 1               | 08/31/18 11:58 | X   |
| K1807185-006DMS | 50              | 08/31/18 12:00 | X   |
| ZZZZZZ          | 50              | 08/31/18 12:02 |     |
| ZZZZZZ          | 5               | 08/31/18 12:05 |     |
| ZZZZZZ          | 5               | 08/31/18 12:07 |     |
| ZZZZZZ          | 5               | 08/31/18 12:09 |     |
| ZZZZZZ          | 5               | 08/31/18 12:12 |     |
| ZZZZZZ          | 5               | 08/31/18 12:14 |     |
| ZZZZZZ          | 5               | 08/31/18 12:16 |     |
| ZZZZZZ          | 5               | 08/31/18 12:19 |     |
| ZZZZZZ          | 5               | 08/31/18 12:21 |     |
| CCV             | 1               | 08/31/18 12:23 | X   |
| CCB             | 1               | 08/31/18 12:26 | X   |
| ZZZZZZ          | 5               | 08/31/18 12:28 |     |



ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807189

Analysis Run Log

Instrument ID: K-FLAA-02

Analytical BatchID: 605054

| Sample          | Dilution Factor | Date/Time      | Se |
|-----------------|-----------------|----------------|----|
| ZZZZZZ          | 5               | 08/31/18 12:30 |    |
| K1807189-006    | 5               | 08/31/18 12:33 | X  |
| ZZZZZZ          | 5               | 08/31/18 12:35 |    |
| K1807189-006DUP | 5               | 08/31/18 12:37 | X  |
| ZZZZZZ          | 5               | 08/31/18 12:39 |    |
| K1807189-006TRP | 5               | 08/31/18 12:42 | X  |
| ZZZZZZ          | 5               | 08/31/18 12:44 |    |
| K1807189-012    | 5               | 08/31/18 12:46 | X  |
| ZZZZZZ          | 5               | 08/31/18 12:49 |    |
| CCV             | 1               | 08/31/18 12:51 | X  |
| CCB             | 1               | 08/31/18 12:53 | X  |
| K1807189-018    | 5               | 08/31/18 12:56 | X  |
| ZZZZZZ          | 5               | 08/31/18 12:58 |    |
| K1807189-024    | 5               | 08/31/18 13:00 | X  |
| ZZZZZZ          | 5               | 08/31/18 13:03 |    |
| K1807189-030    | 5               | 08/31/18 13:22 | X  |
| ZZZZZZ          | 5               | 08/31/18 13:24 |    |
| K1807189-036    | 5               | 08/31/18 13:27 | X  |
| ZZZZZZ          | 5               | 08/31/18 13:29 |    |
| ZZZZZZ -04 SRM  | 50              | 08/31/18 13:32 |    |
| ZZZZZZ          | 50              | 08/31/18 13:34 |    |
| CCV             | 1               | 08/31/18 13:36 | X  |
| CCB             | 1               | 08/31/18 13:38 | X  |
| K1807185-006MS  | 50              | 08/31/18 13:41 | X  |
| ZZZZZZ          | 50              | 08/31/18 13:43 |    |
| ZZZZZZ          | 50              | 08/31/18 13:45 |    |
| ZZZZZZ          | 50              | 08/31/18 13:48 |    |
| ZZZZZZ          | 5               | 08/31/18 13:51 |    |
| ZZZZZZ          | 5               | 08/31/18 13:54 |    |
| ZZZZZZ          | 5               | 08/31/18 13:56 |    |
| ZZZZZZ          | 5               | 08/31/18 13:58 |    |
| CCV             | 1               | 08/31/18 14:01 | X  |
| CCB             | 1               | 08/31/18 14:03 | X  |

ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807189

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument ID: K-ICP-MS-06

Analytical BatchID: 604807

| Sample          | Date/Time      | Li6NG | Sc45He | Ge72H2 | Ge72He | In115He | Lu175He | Th232He |
|-----------------|----------------|-------|--------|--------|--------|---------|---------|---------|
| ZZZZZZ          | 08/30/18 17:19 |       |        |        |        |         |         |         |
| ZZZZZZ          | 08/30/18 17:22 |       |        |        |        |         |         |         |
| ICV             | 08/30/18 17:25 | 95    | 94     | 97     | 99     | 98      | 99      | 100     |
| CCV             | 08/30/18 17:29 | 92    | 90     | 94     | 92     | 92      | 96      | 97      |
| ICB             | 08/30/18 17:32 | 91    | 95     | 96     | 100    | 98      | 101     | 102     |
| CCB             | 08/30/18 17:35 | 91    | 95     | 95     | 97     | 96      | 101     | 101     |
| LLICVT          | 08/30/18 17:38 | 91    | 92     | 92     | 97     | 96      | 99      | 100     |
| ICSA            | 08/30/18 17:41 | 82    | 87     | 90     | 95     | 89      | 97      | 97      |
| ICSAB           | 08/30/18 17:44 | 82    | 88     | 91     | 99     | 89      | 97      | 97      |
| ZZZZZZ          | 08/30/18 17:47 |       |        |        |        |         |         |         |
| KQ1811997-01MB  | 08/30/18 17:50 | 84    | 89     | 93     | 95     | 95      | 99      | 99      |
| KQ1811997-02LCS | 08/30/18 17:53 | 85    | 89     | 93     | 93     | 94      | 100     | 101     |
| KQ1811997-03SRM | 08/30/18 17:57 |       |        |        |        |         |         |         |
| KQ1811997-04SRM | 08/30/18 18:00 |       |        |        |        |         |         |         |
| ZZZZZZ          | 08/30/18 18:03 |       |        |        |        |         |         |         |
| K1807185-006SDL | 08/30/18 18:06 | 90    | 76     | 88     | 81     | 84      | 90      | 90      |
| K1807185-006PS  | 08/30/18 18:09 | 80    | 88     | 89     | 93     | 92      | 100     | 102     |
| K1807185-006MS  | 08/30/18 18:12 | 85    | 91     | 95     | 95     | 93      | 99      | 101     |
| K1807185-006DMS | 08/30/18 18:16 | 89    | 91     | 97     | 96     | 94      | 98      | 99      |
| CCV             | 08/30/18 18:19 | 95    | 95     | 99     | 98     | 97      | 99      | 99      |
| CCB             | 08/30/18 18:22 | 93    | 95     | 98     | 100    | 98      | 100     | 100     |
| ZZZZZZ          | 08/30/18 18:25 |       |        |        |        |         |         |         |
| ZZZZZZ          | 08/30/18 18:28 |       |        |        |        |         |         |         |
| ZZZZZZ          | 08/30/18 18:31 |       |        |        |        |         |         |         |
| ZZZZZZ          | 08/30/18 18:34 |       |        |        |        |         |         |         |
| ZZZZZZ          | 08/30/18 18:37 |       |        |        |        |         |         |         |
| K1807189-006    | 08/30/18 18:41 | 109   | 107    | 106    | 107    | 100     | 98      | 96      |
| K1807189-006DUP | 08/30/18 18:44 | 110   | 108    | 107    | 107    | 100     | 97      | 97      |
| K1807189-006DUP | 08/30/18 18:47 | 112   | 107    | 108    | 107    | 99      | 97      | 96      |
| K1807189-012    | 08/30/18 18:50 | 112   | 109    | 108    | 108    | 100     | 98      | 97      |
| K1807189-018    | 08/30/18 18:53 | 113   | 107    | 110    | 110    | 99      | 97      | 96      |
| CCV             | 08/30/18 18:56 | 114   | 108    | 110    | 109    | 100     | 98      | 98      |
| CCB             | 08/30/18 18:59 | 109   | 105    | 106    | 109    | 100     | 98      | 96      |
| K1807189-024    | 08/30/18 19:02 | 104   | 104    | 103    | 102    | 95      | 95      | 96      |
| K1807189-030    | 08/30/18 19:06 | 108   | 107    | 106    | 106    | 99      | 97      | 97      |
| K1807189-036    | 08/30/18 19:09 | 111   | 109    | 107    | 109    | 99      | 97      | 96      |
| CCV             | 08/30/18 19:12 | 113   | 106    | 108    | 107    | 99      | 97      | 95      |

ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: 2018 Northern Pike Tissue Study/SFP-139A

Service Request: K1807189

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument ID: K-ICP-MS-06

Analytical BatchID: 604807

| Sample | Date/Time      | Li6NG | Sc45He | Ge72H2 | Ge72He | In115He | Lu175He | Th232He |
|--------|----------------|-------|--------|--------|--------|---------|---------|---------|
| CCB    | 08/30/18 19:15 | 108   | 103    | 106    | 106    | 99      | 97      | 96      |
| LLCCVT | 08/30/18 19:18 | 107   | 105    | 104    | 107    | 101     | 99      | 98      |

# US EPA Tune Check Report

Operator Name ALKLS NoUser  
 Acq/Data Batch D:\Agilent\ICPMH\1\DATA\BatchTemplate\Experiments\083018.b  
 Acq. Date-Time 2018-08-30 12:22:44 PM  
 Report Comment ---  
 Instrument Name G8421A JP16310358

[No Gas]

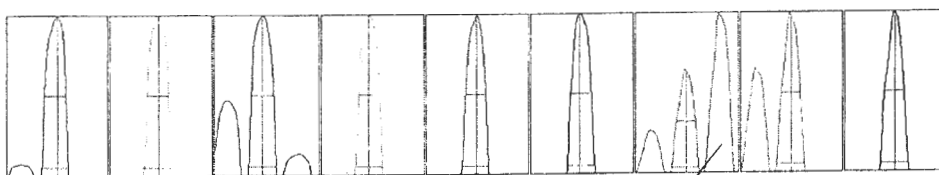
Sensitivity

| Mass | CPS       | RSD%  | RSD% (Required) | RSD% (Flag) |
|------|-----------|-------|-----------------|-------------|
| 7    | 124989.45 | 0.864 | 5.000           |             |
| 9    | 30959.83  | 0.550 | 5.000           |             |
| 24   | 87758.84  | 0.713 | 5.000           |             |
| 59   | 148801.99 | 0.700 | 5.000           |             |
| 115  | 259218.18 | 0.614 | 5.000           |             |
| 140  | 268285.51 | 0.564 | 5.000           |             |
| 208  | 152638.68 | 0.464 | 5.000           |             |
| 209  | 237315.50 | 1.098 | 5.000           |             |
| 238  | 291979.89 | 0.622 | 5.000           |             |

| Mass | Rep#1 Count | Rep#2 Count | Rep#3 Count | Rep#4 Count | Rep#5 Count |
|------|-------------|-------------|-------------|-------------|-------------|
| 7    | 12628       | 12518       | 12563       | 12353       | 12433       |
| 9    | 3116        | 3083        | 3097        | 3076        | 3108        |
| 24   | 8885        | 8764        | 8760        | 8734        | 8736        |
| 59   | 14996       | 14926       | 14836       | 14918       | 14724       |
| 115  | 26119       | 25988       | 25985       | 25738       | 25779       |
| 140  | 26941       | 26886       | 26952       | 26776       | 26588       |
| 208  | 15282       | 15376       | 15252       | 15195       | 15215       |
| 209  | 24089       | 23736       | 23868       | 23471       | 23493       |
| 238  | 29406       | 29174       | 29355       | 28975       | 29080       |

Integration Time [sec] 0.1

Resolution/Axis



| Mass | Peak Height | Axis  | Axis (Required) | Axis (Flag) | W-5%  | W-5% (Flag) | W-5% (Required) |
|------|-------------|-------|-----------------|-------------|-------|-------------|-----------------|
| 7    | 20724.63    | 7.05  | 6.90 - 7.10     |             | 0.782 |             | 0.900           |
| 9    | 5155.75     | 8.95  | 8.90 - 9.10     |             | 0.777 |             | 0.900           |
| 24   | 14206.22    | 23.90 | 23.90 - 24.10   |             | 0.786 |             | 0.900           |

# US EPA Tune Check Report

| Mass | Peak Height | Axis   | Axis (Required) | Axis (Flag) | W-5%  | W-5% (Flag) | W-5% (Required) |
|------|-------------|--------|-----------------|-------------|-------|-------------|-----------------|
| 59   | 24979.05    | 58.90  | 58.90 - 59.10   |             | 0.782 |             | 0.900           |
| 115  | 45988.66    | 115.00 | 114.90 - 115.10 |             | 0.775 |             | 0.900           |
| 140  | 47662.54    | 139.95 | 139.90 - 140.10 |             | 0.777 |             | 0.900           |
| 208  | 29030.71    | 208.00 | 207.90 - 208.10 |             | 0.780 |             | 0.900           |
| 209  | 44716.68    | 209.00 | 208.90 - 209.10 |             | 0.813 |             | 0.900           |
| 238  | 54753.89    | 238.00 | 237.90 - 238.10 |             | 0.821 |             | 0.900           |

Integration Time [sec] 0.1  
 Acquisition Time [sec] 268.4  
 Y Axis Linear

## Tune Parameters

### Plasma Parameters

|              |        |                |            |               |            |
|--------------|--------|----------------|------------|---------------|------------|
| Plasma Mode  | ---    | Nebulizer Gas  | 0.70 L/min | Dilution Gas  | 0.35 L/min |
| RF Power     | 1600 W | Option Gas     | ---        | Auxiliary Gas | 0.90 L/min |
| RF Matching  | 1.60 V | Nebulizer Pump | 0.10 rps   | Plasma Gas    | 15.0 L/min |
| Sample Depth | 8.0 mm | S/C Temp       | 2 °C       |               |            |

### Lens Parameters

|            |          |               |       |            |        |
|------------|----------|---------------|-------|------------|--------|
| Extract 1  | 0.0 V    | Omega Lens    | 8.0 V | Deflect    | 14.2 V |
| Extract 2  | -145.0 V | Cell Entrance | -30 V | Plate Bias | -55 V  |
| Omega Bias | -75 V    | Cell Exit     | -50 V |            |        |

### Cell Parameters

|         |            |              |        |                       |       |
|---------|------------|--------------|--------|-----------------------|-------|
| Use Gas | No         | 3rd Gas Flow | ---    | Energy Discrimination | 5.0 V |
| He Flow | 0.0 mL/min | OctP Bias    | -8.0 V |                       |       |
| H2 Flow | 0.0 mL/min | OctP RF      | 200 V  |                       |       |

### QP Parameters

|             |     |             |        |         |        |
|-------------|-----|-------------|--------|---------|--------|
| Mass Gain   | 127 | Axis Gain   | 1.0005 | QP Bias | -3.0 V |
| Mass Offset | 125 | Axis Offset | 0.00   |         |        |

## Hardware Settings

### Torch

|         |        |         |        |
|---------|--------|---------|--------|
| Torch H | 0.2 mm | Torch V | 0.7 mm |
|---------|--------|---------|--------|

### EM

|               |        |           |        |          |        |
|---------------|--------|-----------|--------|----------|--------|
| Discriminator | 4.2 mV | Analog HV | 2151 V | Pulse HV | 1174 V |
|---------------|--------|-----------|--------|----------|--------|

|       |       |        |       |       |          |     |
|-------|-------|--------|-------|-------|----------|-----|
| 2     | [8.0] | 0.210  | 0.836 | 0.213 | 11:18:04 | Yes |
| 3     | [8.0] | 0.208  | 0.865 | 0.210 | 11:18:38 | Yes |
| Mean: | [8.0] | 0.210  |       |       |          |     |
| SD:   | 0.0   | 0.0011 |       |       |          |     |
| %RSD: | 0.0   | 0.51   |       |       |          |     |

Standard number 6 applied. [8.0]

Correlation Coef.: 0.998986 Slope: 0.02672 Intercept: 0.00000

The calibration curve may not be linear.

## \* Calibration data for Se 196.03 Equation: Linear Through Zero

| ID      | Mean Signal<br>(Abs) | Entered<br>Conc.<br>ug/L | Calculated<br>Conc.<br>ug/L | Standard<br>Deviation | %RSD |
|---------|----------------------|--------------------------|-----------------------------|-----------------------|------|
| Cal Blk | 0.0000               | 0                        | 0.000                       | 0.00                  | 16.7 |
| Std 0.2 | 0.0065               | 0.2                      | 0.243                       | 0.00                  | 4.7  |
| Std 0.5 | 0.0133               | 0.5                      | 0.498                       | 0.00                  | 2.0  |
| Std 1.0 | 0.0278               | 1.0                      | 1.041                       | 0.00                  | 0.9  |
| Std 2.5 | 0.0693               | 2.5                      | 2.594                       | 0.00                  | 1.8  |
| Std 4.0 | 0.1129               | 4.0                      | 4.226                       | 0.00                  | 0.8  |
| Std 8.0 | 0.2095               | 8.0                      | 7.840                       | 0.00                  | 0.5  |

Correlation Coef.: 0.998986 Slope: 0.02672 Intercept: 0.00000

Sequence No.: 8

Autosampler Location: 8

Sample ID: ICV

Date Collected: 8/31/2018 11:19:29 AM

Analyst:

Data Type: Original

## Replicate Data: ICV

| Repl  | SampleConc<br>ug/L | StdConc<br>ug/L | BlkCorr<br>Signal | Peak<br>Area | Peak<br>Height | Bkgnd<br>Area | Bkgnd<br>Height | Time     | Peak<br>Stored |
|-------|--------------------|-----------------|-------------------|--------------|----------------|---------------|-----------------|----------|----------------|
| #     |                    |                 |                   |              |                |               |                 |          |                |
| 1     | 4.238              | 4.238           | 0.113             | 0.437        | 0.115          |               |                 | 11:19:54 | Yes            |
| 2     | 4.081              | 4.081           | 0.109             | 0.442        | 0.111          |               |                 | 11:20:28 | Yes            |
| 3     | 4.068              | 4.068           | 0.109             | 0.436        | 0.111          |               |                 | 11:21:01 | Yes            |
| Mean: | 4.129              | 4.129           | 0.110             |              |                |               |                 |          |                |
| SD:   | 0.095              | 0.095           | 0.0025            |              |                |               |                 |          |                |
| %RSD: | 2.299              | 2.299           | 2.30              |              |                |               |                 |          |                |

QC value within limits for Se 196.03 Recovery = 103.23%

All analyte(s) passed QC.

Sequence No.: 9

Autosampler Location: 1

Sample ID: ICB

Date Collected: 8/31/2018 11:21:53 AM

Analyst:

Data Type: Original

## Replicate Data: ICB

| Repl  | SampleConc<br>ug/L | StdConc<br>ug/L | BlkCorr<br>Signal | Peak<br>Area | Peak<br>Height | Bkgnd<br>Area | Bkgnd<br>Height | Time     | Peak<br>Stored |
|-------|--------------------|-----------------|-------------------|--------------|----------------|---------------|-----------------|----------|----------------|
| #     |                    |                 |                   |              |                |               |                 |          |                |
| 1     | -0.011             | -0.011          | -0.000            | 0.005        | 0.002          |               |                 | 11:22:14 | Yes            |
| 2     | -0.027             | -0.027          | -0.001            | -0.006       | 0.001          |               |                 | 11:22:48 | Yes            |
| 3     | -0.028             | -0.028          | -0.001            | 0.002        | 0.001          |               |                 | 11:23:21 | Yes            |
| Mean: | -0.022             | -0.022          | -0.001            |              |                |               |                 |          |                |
| SD:   | 0.010              | 0.010           | 0.0003            |              |                |               |                 |          |                |
| %RSD: | 42.44              | 42.44           | 42.44             |              |                |               |                 |          |                |

QC value within limits for Se 196.03 Recovery = Not calculated

All analyte(s) passed QC.

Sequence No.: 10

Autosampler Location: 2

Sample ID: LLICV 0.2ppb

Date Collected: 8/31/2018 11:24:10 AM

Analyst:

Data Type: Original

## Replicate Data: LLICV 0.2ppb

| Repl | SampleConc | StdConc | BlkCorr | Peak | Peak | Bkgnd | Bkgnd | Time | Peak |
|------|------------|---------|---------|------|------|-------|-------|------|------|
|------|------------|---------|---------|------|------|-------|-------|------|------|

**ALS Environmental  
FAA Run Log**

|                                                                                                |                            |
|------------------------------------------------------------------------------------------------|----------------------------|
| <b>Method:</b> (Circle Method Used)<br>7742 7062<br>Other: <u>          </u><br>Element: As Se | <b>Service Request # :</b> |
|------------------------------------------------------------------------------------------------|----------------------------|

| SAMPLE<br>NUMBER  | Dilution<br>Factor | Measured<br>(µg/L) | Recoveries<br>(ICV, CCV, CRA, LCS,<br>Matrix Spk.) |             | Comments<br><br>Post Spike = 2.5 ppb |
|-------------------|--------------------|--------------------|----------------------------------------------------|-------------|--------------------------------------|
| Cal. Blk          | -                  | 0.000              |                                                    |             |                                      |
| Cal. Std 0.5      | -                  | 0.200              | *(0.010-50ml)                                      |             | *Cal. Std = AA1-24-H                 |
| Cal. Std 0.5      | -                  | 0.500              | *(0.025-50ml)                                      |             | *Cal. Std = AA1-24-H                 |
| Cal. Std 1.0      | -                  | 1.000              | *(0.05-50ml)                                       |             |                                      |
| Cal. Std 2.5      | -                  | 2.500              | *(0.125-50ml)                                      |             |                                      |
| Cal. Std 4.0      | -                  | 4.000              | *(0.200-50ml)                                      |             |                                      |
| Cal. Std 8.0      | -                  | 8.000              | *(0.400-50ml)                                      |             |                                      |
| ICV               | -                  | 4.129 ✓            | 103%                                               |             | ICV Std = AA1-25-I                   |
| ICB               | -                  | -0.022             |                                                    |             |                                      |
| LLICV 0.2ppb      | -                  | 0.189 ✓            | 94%                                                |             |                                      |
| CCV               | -                  | 4.221 ✓            | 106%                                               |             |                                      |
| CCB               | -                  | -0.013             |                                                    |             |                                      |
| KQ1811997-01 5X   | 1/5                | 0.011              |                                                    |             |                                      |
| KQ1811997-02 50X  | 1/50               | 3.158 ✓            | 95%                                                |             |                                      |
| KQ1811997-03 10X  | 1/10               | 0.382              |                                                    | Cx= 3.598 ✓ |                                      |
| KQ1811997-03A 10X | 1/10               | 0.648              | 106%                                               |             | 10.6%                                |
| KQ1811997-04 50X  | 1/50               | 1.091              |                                                    |             | See re-dilution                      |
| KQ1811997-04A 50X | 1/50               | 3.022              |                                                    |             | See re-dilution                      |
| K1807185-006 5X   | 1/5                | 2.257              |                                                    |             | See re-dilution                      |
| K1807185-006A 5X  | 1/5                | 3.015              |                                                    |             | See re-dilution                      |
| KQ1811997-05 50X  | 1/50               | 2.575              |                                                    |             | See re-dilution                      |
| KQ1811997-05A 50X | 1/50               | 4.924              |                                                    |             | See re-dilution                      |
| CCV               | -                  | 4.196 ✓            | 105%                                               |             |                                      |
| CCB               | -                  | -0.014             |                                                    |             |                                      |
| KQ1811997-06 50X  | 1/50               | 2.139              | 73%                                                | Cx= 3.148   |                                      |
| KQ1811997-06A 50X | 1/50               | 3.837              |                                                    |             | 67.9%                                |
| K1807185-012 5X   | 1/5                | 1.691              |                                                    | Cx= 2.891   |                                      |
| K1807185-012A 5X  | 1/5                | 3.153              |                                                    |             | 58.5%                                |
| K1807185-018 5X   | 1/5                | 2.344              |                                                    | Cx= 7.461   |                                      |
| K1807185-018A 5X  | 1/5                | 3.130              |                                                    |             | 31.4%                                |
|                   |                    |                    |                                                    |             |                                      |

|                                                  |                 |                 |                     |                 |
|--------------------------------------------------|-----------------|-----------------|---------------------|-----------------|
| <b>True Values/QC Limits:</b>                    | LCSW            | Water Spike     | LCSS (ERA D099-540) | Soil Spike      |
| Arsenic:                                         | 10ppb (80-120%) | 16ppb (75-125%) | 171mg/kg (113-209)  | 40ppb (75-125%) |
| Selenium                                         | 10ppb (80-120%) | 16ppb (75-125%) | 206mg/kg (131-252)  | 40ppb (75-125%) |
| Cx = MSA Corrected Concentration (as per method) |                 |                 |                     |                 |

|                                                                             |                                                                                  |                                                                                   |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| <b>Analyst</b><br><div style="text-align: center; font-size: 2em;">3L</div> | <b>Date:</b><br><div style="text-align: center; font-size: 1.5em;">8/31/18</div> | <b>Page Number:</b><br><div style="text-align: center; font-size: 1.5em;">1</div> |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|

ALS Environmental  
FAA Run Log

|                                                                                    |                            |
|------------------------------------------------------------------------------------|----------------------------|
| <b>Method:</b> (Circle Method Used)<br>7742 7062<br>Other: _____<br>Element: As Se | <b>Service Request # :</b> |
|------------------------------------------------------------------------------------|----------------------------|

| SAMPLE<br>NUMBER  | Dilution<br>Factor | Measured<br>(µg/L) | Recoveries<br>(ICV, CCV, CRA, LCS,<br>Matrix Spk.) |     | Comments<br><br>Post Spike = 2.5 ppb |
|-------------------|--------------------|--------------------|----------------------------------------------------|-----|--------------------------------------|
| K1807185-024 5X   | 1/5                | 1.830              |                                                    | Cx= | 3.005                                |
| K1807185-024A 5X  | 1/5                | 3.352              |                                                    |     | 60.9%                                |
| K1807185-030 5X   | 1/5                | 2.048              |                                                    | Cx= | 4.029                                |
| K1807185-030A 5X  | 1/5                | 3.319              |                                                    |     | 50.8%                                |
| CCV               | -                  | 4.141 ✓            | 104%                                               |     |                                      |
| CCB               | -                  | -0.012             |                                                    |     |                                      |
| K1807185-036 5X   | 1/5                | 2.099              |                                                    | Cx= | 4.485                                |
| K1807185-036A 5X  | 1/5                | 3.269              |                                                    |     | 46.8%                                |
| K1807189-006 5X   | 1/5                | 1.965              |                                                    | Cx= | 6.845 ✓                              |
| K1807189-006A 5X  | 1/5                | 2.683              |                                                    |     | 28.7%                                |
| KQ1811997-08 5X   | 1/5                | 1.928              |                                                    | Cx= | 7.474 ✓                              |
| KQ1811997-08A 5X  | 1/5                | 2.573              |                                                    |     | 25.8%                                |
| KQ1811997-09 5X   | 1/5                | 1.874              |                                                    | Cx= | 6.774 ✓                              |
| KQ1811997-09A 5X  | 1/5                | 2.566              |                                                    |     | 27.7%                                |
| K1807189-012 5X   | 1/5                | 1.835              |                                                    | Cx= | 7.177 ✓                              |
| K1807189-012A 5X  | 1/5                | 2.474              |                                                    |     | 25.6%                                |
| CCV               | -                  | 3.968 ✓            | 99%                                                |     |                                      |
| CCB               | -                  | -0.017             |                                                    |     |                                      |
| K1807189-018 5X   | 1/5                | 1.895              |                                                    | Cx= | 6.115 ✓                              |
| K1807189-018A 5X  | 1/5                | 2.670              |                                                    |     | 31.0%                                |
| K1807189-024 5X   | 1/5                | 2.374              |                                                    | Cx= | 5.236 ✓                              |
| K1807189-024A 5X  | 1/5                | 3.508              |                                                    |     | 45.3%                                |
| K1807189-030 5X   | 1/5                | 2.150              |                                                    | Cx= | 5.508 ✓                              |
| K1807189-030A 5X  | 1/5                | 3.126              |                                                    |     | 39.0%                                |
| K1807189-036 5X   | 1/5                | 2.111              |                                                    | Cx= | 5.038 ✓                              |
| K1807189-036A 5X  | 1/5                | 3.159              |                                                    |     | 41.9%                                |
| KQ1811997-04 50X  | 1/50               | 1.103              | 103%                                               | Cx= | 2.226 ✓                              |
| KQ1811997-04A 50X | 1/50               | 2.343              |                                                    |     | 49.6%                                |
| CCV               | -                  | 4.041 ✓            | 101%                                               |     |                                      |
| CCB               | -                  | -0.017             |                                                    |     |                                      |

|                               |                 |                 |                     |                 |
|-------------------------------|-----------------|-----------------|---------------------|-----------------|
| <b>True Values/QC Limits:</b> | LCSW            | Water Spike     | LCSS (ERA D099-540) | Soil Spike      |
| Arsenic:                      | 10ppb (80-120%) | 16ppb (75-125%) | 171mg/kg (113-209)  | 40ppb (75-125%) |
| Selenium                      | 10ppb (80-120%) | 16ppb (75-125%) | 206mg/kg (131-252)  | 40ppb (75-125%) |

Cx = MSA Corrected Concentration (as per method)

|                                                                                 |                                                                                      |                                                                     |
|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| <b>Analyst</b><br><br><div style="font-size: 2em; text-align: center;">32</div> | <b>Date:</b><br><br><div style="font-size: 1.5em; text-align: center;">8/31/18</div> | <b>Page Number:</b><br><br><div style="text-align: center;">2</div> |
|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------|



## ALS Enviromental FAA Run Log

|                                                                                  |                           |
|----------------------------------------------------------------------------------|---------------------------|
| Method: (Circle Method Used)<br>742 7062<br>Other: _____<br>Element: As Se _____ | Service Request # : _____ |
|----------------------------------------------------------------------------------|---------------------------|

[illegible]

| True Values/QC Limits:                           | LCSW            | Water Spike     | LCSS (ERA D099-540) | Soil Spike      |
|--------------------------------------------------|-----------------|-----------------|---------------------|-----------------|
| Arsenic:                                         | 10ppb (80-120%) | 16ppb (75-125%) | 171mg/kg (113-209)  | 40ppb (75-125%) |
| Selenium                                         | 10ppb (80-120%) | 16ppb (75-125%) | 206mg/kg (131-252)  | 40ppb (75-125%) |
| Cx = MSA Corrected Concentration (as per method) |                 |                 |                     |                 |

|         |         |              |
|---------|---------|--------------|
| Analyst | Date:   | Page Number: |
| 3C      | 8/31/11 | 3            |

## Preparation Information Benchsheet

**Prep Run:** 320955    **Prep Workflow:** MetDigTissMS    **Status:** Prepped    **Prep Date:** 08/29/2018 19:30 ✓  
**Team:** Metals    **Prep Method:** PSEP Metals    **Current Step:** Digestion    **Due Date:** 08/23/2018  
**Analyst:** CLUKKEN    **Rush/NPDES:** N/A    **Hold Date:** 01/21/2019

| Lab Code                      | Client ID                            | Batch # | Final Amt | Container    | Final Volume | Added Amt                                         | Client ID                                      | Notes           |
|-------------------------------|--------------------------------------|---------|-----------|--------------|--------------|---------------------------------------------------|------------------------------------------------|-----------------|
| KQ1811997-01                  | Method Blank                         |         | 0.300 g   |              | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| KQ1811997-02                  | Lab Control Sample                   |         | 0.300 g   |              | 30 mL        | 0.3 mL<br>0.05 mL<br>0.3 mL<br>0.05 mL<br>0.05 mL | 191144<br>191777<br>191813<br>191959<br>191977 | 15% ULTREX HNO3 |
| KQ1811997-03                  | Standard Reference Material          |         | 0.302 g   |              | 30 mL        | 0.3 g                                             | 186748                                         | 15% ULTREX HNO3 |
| KQ1811997-04                  | Standard Reference Material          |         | 0.301 g   |              | 30 mL        | 0.3 g                                             | 189725                                         | 15% ULTREX HNO3 |
| K1807185-006                  | EPA-NP-A1                            | .02     | 0.300 g   | Freeze-Dried | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807185-006:<br>KQ1811997-05 | Matrix Spike                         | .02     | 0.301 g   | Freeze-Dried | 30 mL        | 0.3 mL<br>0.05 mL<br>0.3 mL<br>0.05 mL<br>0.05 mL | 191144<br>191777<br>191813<br>191959<br>191977 | 15% ULTREX HNO3 |
| K1807185-006:<br>KQ1811997-06 | Duplicate Matrix Spike               | .02     | 0.302 g   | Freeze-Dried | 30 mL        | 0.3 mL<br>0.05 mL<br>0.3 mL<br>0.05 mL<br>0.05 mL | 191144<br>191777<br>191813<br>191959<br>191977 | 15% ULTREX HNO3 |
| K1807185-012                  | EPA-NP-A2                            | .02     | 0.301 g   | Freeze-Dried | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807185-018                  | EPA-NP-A3                            | .02     | 0.301 g   | Freeze-Dried | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807185-024                  | EPA-NP-A4                            | .02     | 0.302 g   | Freeze-Dried | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807185-030                  | EPA-NP-A5                            | .02     | 0.301 g   | Freeze-Dried | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807185-036                  | EPA-NP-A6                            | .02     | 0.301 g   | Freeze-Dried | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807189-006                  | EPA-NP-B1                            | .02     | 0.302 g   | Freeze-Dried | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807189-006:<br>KQ1811997-08 | Duplicate                            | .02     | 0.300 g   | Freeze-Dried | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807189-006:<br>KQ1811997-09 | Duplicate<br><i>Triplicate Spike</i> | .02     | 0.301 g   | Freeze-Dried | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807189-012                  | EPA-NP-B2                            | .02     | 0.300 g   | Freeze-Dried | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807189-018                  | EPA-NP-B3                            | .02     | 0.300 g   | Freeze-Dried | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807189-024                  | EPA-NP-B4                            | .02     | 0.301 g   | Freeze-Dried | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807189-030                  | EPA-NP-B5                            | .02     | 0.301 g   | Freeze-Dried | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |
| K1807189-036                  | EPA-NP-B6                            | .02     | 0.301 g   | Freeze-Dried | 30 mL        |                                                   |                                                | 15% ULTREX HNO3 |

20 Total Samples consisting of 12 Client Samples, 4 Client QC Samples, 4 Batch QC Samples associated with the current Prep Run.

**Spiking Solutions**

| Name         | Type  | ID     | Expires    | Name                | Type  | ID     | Expires    |
|--------------|-------|--------|------------|---------------------|-------|--------|------------|
| K-MET DORM-4 | Spike | 186748 | 12/28/2018 | K-MET SS5           | Spike | 191977 | 10/18/2018 |
| K-MET SS1    | Spike | 191813 | 9/14/2018  | K-MET TORT-3        | Spike | 189725 | 1/16/2019  |
| K-MET SS3    | Spike | 191777 | 2/27/2019  | Sulfur 1000 ug/mL S | Spike | 191144 | 12/31/2019 |
| K-MET SS4    | Spike | 191959 | 11/10/2018 |                     |       |        |            |

**Preparation Materials**

| Step      | Name                       | ID     | Step      | Name       | ID     |
|-----------|----------------------------|--------|-----------|------------|--------|
| Digestion | K-MET 50ml Centrifuge Tube | 191046 | Digestion | K-MET HNO3 | 192004 |

**Preparation Hardware / Equipment**

| Step      | Name             | Property                 | Value | Step      | Name               | Property | Value |
|-----------|------------------|--------------------------|-------|-----------|--------------------|----------|-------|
| Digestion | K-Metals-Oven-01 | Observed Temperature In  | 105   | Digestion | K-Tissue Pipette 2 |          |       |
| Digestion | K-Metals-Oven-01 | Observed Temperature Out | 105   |           |                    |          |       |

**Preparation Steps**

| Step      | Started         | Finished        | By      | Assisted By | Training? | Comments |
|-----------|-----------------|-----------------|---------|-------------|-----------|----------|
| Digestion | 29-AUG-18 19:30 | 30-AUG-18 10:25 | CLUKKEN |             | N         |          |

**Comments****Review**

Reviewed by: 4 Date: 8/30/18

**ALS Group USA, Corp.**  
dba ALS Environmental  
Analytical Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish tissue

**Service Request:** K1807189  
**Date Collected:** 07/25-26/18  
**Date Received:** 07/28/18

Mercury, Total

**Prep Method:** METHOD  
**Analysis Method:** 1631E  
**Test Notes:**

**Units:** ng/g  
**Basis:** Dry

| Sample Name    | Lab Code     | MRL | MDL  | Dilution<br>Factor | Date<br>Extracted | Date<br>Analyzed | Result | Result<br>Notes |
|----------------|--------------|-----|------|--------------------|-------------------|------------------|--------|-----------------|
| EPA-NP-B1      | K1807189-006 | 5.0 | 0.45 | 5                  | 08/29/18 ✓        | 08/30/18 ✓       | 326 ✓  |                 |
| EPA-NP-B2      | K1807189-012 | 4.8 | 0.44 | 5                  | 08/29/18          | 08/30/18         | 484 ✓  |                 |
| EPA-NP-B3      | K1807189-018 | 4.9 | 0.44 | 5                  | 08/29/18          | 08/30/18         | 528 ✓  |                 |
| EPA-NP-B4      | K1807189-024 | 5.0 | 0.45 | 5                  | 08/29/18          | 08/30/18         | 604 ✓  |                 |
| EPA-NP-B5      | K1807189-030 | 5.0 | 0.45 | 5                  | 08/29/18          | 08/30/18         | 412 ✓  |                 |
| EPA-NP-B6      | K1807189-036 | 4.9 | 0.44 | 5                  | 08/29/18          | 08/30/18         | 964 ✓  |                 |
| Method Blank 1 | K1807189-MB  | 1.0 | 0.09 | 1                  | 08/29/18          | 08/30/18         | ND     |                 |
| Method Blank 2 | K1807189-MB  | 1.0 | 0.09 | 1                  | 08/29/18          | 08/30/18         | ND     |                 |
| Method Blank 3 | K1807189-MB  | 1.0 | 0.09 | 1                  | 08/29/18          | 08/30/18         | 0.13   | J               |

*no impact*

**ALS Group USA, Corp.**  
**dba ALS Environmental**  
**QA/QC Report**

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish tissue

**Service Request:** K1807189  
**Date Collected:** 07/26/18  
**Date Received:** 07/28/18  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30/18

**Matrix Spike/Duplicate Matrix Spike Summary**  
**Total Metals**

**Sample Name:** EPA-NP-B1 ✓ **Units:** ng/g  
**Lab Code:** K1807189-006MS, K1807189-006DMS **Basis:** Dry  
**Test Notes:**

| Analyte | Prep Method | Analysis Method | MRL | Spike Level |     | Sample Result | Spike Result |       | Percent Recovery |      | ALS Acceptance Limits | Relative Percent Difference | Result Notes |
|---------|-------------|-----------------|-----|-------------|-----|---------------|--------------|-------|------------------|------|-----------------------|-----------------------------|--------------|
|         |             |                 |     | MS          | DMS |               | MS           | DMS   | MS               | DMS  |                       |                             |              |
| Mercury | METHOD      | 1631E           | 5.0 | 248         | 250 | 326 ✓         | 597 ✓        | 561 ✓ | 109 ✓            | 94 ✓ | 70-130                | 6 ✓                         |              |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish tissue

**Service Request:** K1807189  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30/18

Triplicate Summary  
Metals

**Sample Name:** Batch QC  
**Lab Code:** K1807185-006TRP  
**Test Notes:**

*Teck  
sample*

**Units:** ng/g  
**Basis:** Dry

| Analyte | Prep<br>Method | Analysis<br>Method | Sample<br>Result | Duplicate<br>Sample<br>Result | Triplicate<br>Sample<br>Result | Average | Relative<br>Standard<br>Deviation | Result<br>Notes |
|---------|----------------|--------------------|------------------|-------------------------------|--------------------------------|---------|-----------------------------------|-----------------|
| Mercury | METHOD         | 1631E              | 347              | 339                           | 365                            | 350     | 3.8                               | ✓               |

**ALS Group USA, Corp.**  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**LCS Matrix:** Water

**Service Request:** K1807189  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/30/18

Ongoing Precision and Recovery (OPR) Sample Summary  
Total Metals

**Sample Name:** Ongoing Precision and Recovery (Initial) **Units:** ng/g  
**Basis:** NA

**Test Notes:**

| Analyte | Prep<br>Method | Analysis<br>Method | True<br>Value | Result | Percent<br>Recovery | ALS<br>Percent<br>Recovery | Result<br>Notes |
|---------|----------------|--------------------|---------------|--------|---------------------|----------------------------|-----------------|
|         |                |                    |               |        |                     | Acceptance<br>Limits       |                 |
| Mercury | METHOD         | 1631E              | 5.00          | 5.50 ✓ | 110 ✓               | 70-130                     |                 |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**LCS Matrix:** Water

**Service Request:** K1807189  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/30/18

Ongoing Precision and Recovery (OPR) Sample Summary  
Total Metals

**Sample Name:** Ongoing Precision and Recovery (Final)

**Units:** ng/g  
**Basis:** NA

**Test Notes:**

| Analyte | Prep<br>Method | Analysis<br>Method | True<br>Value | Result | Percent<br>Recovery | ALS<br>Percent<br>Recovery<br>Acceptance<br>Limits | Result<br>Notes |
|---------|----------------|--------------------|---------------|--------|---------------------|----------------------------------------------------|-----------------|
|         |                |                    |               |        |                     |                                                    |                 |
| Mercury | METHOD         | 1631E              | 5.00          | 5.40 ✓ | 108 ✓               | 70-130                                             |                 |



**ALS Group USA, Corp.**  
**dba ALS Environmental**  
**QA/QC Report**

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**LCS Matrix:** Fish tissue

**Service Request:** K1807189  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30/18

Quality Control Sample (QCS) Summary  
Total Metals

**Sample Name:** Quality Control Sample  
**Lab Code:**  
**Test Notes:** Tort-3 Solids = 99.1%

**Units:** ng/g  
**Basis:** Dry

**Source:** TORT-3

| Analyte | Prep Method | Analysis Method | True Value | Result | Percent Recovery | ALS Percent Recovery | Result Notes |
|---------|-------------|-----------------|------------|--------|------------------|----------------------|--------------|
|         |             |                 |            |        |                  | Acceptance Limits    |              |
| Mercury | METHOD      | 1631E           | 292        | 274 ✓  | 94 ✓             | 70-130               |              |

## QA Summary Report

Batch Number:

Method Number: EPA 1631E

Project Number(s): TISSUES

Instrument ID: K-AFS-04

Date Analyzed: 8/30/18 ✓

Analyst Name: Anna Boyer

| Calibration        |          |                 |       |             |            |             |        |           |        |
|--------------------|----------|-----------------|-------|-------------|------------|-------------|--------|-----------|--------|
| QA Sample Type     | Name/ID  | Analyzed Result | Units | Spike Level | % REC<br>✓ | % REC Limit | RSD    | RSD Limit | Notes  |
| Calibration        | 12.5 pg  | 12.2            | pg    | 12.5        | 97.6       | 75-125      |        |           | accept |
|                    | 25 pg    | 26.6            | pg    | 25          | 106        | 75-125      |        |           | accept |
|                    | 100 pg   | 96.9            | pg    | 100         | 96.9       | 75-125      |        |           | accept |
|                    | 500 pg   | 515             | pg    | 500         | 103        | 75-125      |        |           | accept |
|                    | 2500 pg  | 2,390           | pg    | 2500        | 95.8       | 75-125      |        |           | accept |
|                    | 10000 pg | 10,100          | pg    | 10000       | 101        | 75-125      |        |           | accept |
| Calibration Factor |          | 0.000101 ✓      | pg/PA |             |            |             | 4.06 ✓ | < 15      | accept |
| Calibration Date   |          | 8/30/18 ✓       |       |             |            |             |        |           |        |

## QA Summary Report

Batch Number:

Method Number: EPA 1631E

Project Number(s): TISSUES

Instrument ID: K-AFS-04

Date Analyzed: 8/30/18

Analyst Name: Anna Boyer

| Blank Summary  |          |                 |       |          |        |             |        |
|----------------|----------|-----------------|-------|----------|--------|-------------|--------|
| QA Sample Type | Name/ID  | Analyzed Result | Units | Criteria | StDev  | StDev Limit | Notes  |
| CB             | CB-1     | 2.92            | pg    | < 50     |        |             | accept |
|                | CB-2     | 3.56            | pg    | < 50     |        |             | accept |
|                | CB-3     | 3.14            | pg    | < 50     |        |             | accept |
|                | CB-4     | 3.60            | pg    | < 50     |        |             | accept |
| Average        | PA 32869 | 3.31            | pg    | < 25     | 0.332  | < 10        | accept |
| MBA            | MB-1     | 0.0382          | µg/Kg | <1.0     |        |             | accept |
|                | MB-2     | 0.0644          | µg/Kg | <1.0     |        |             | accept |
|                | MB-3     | 0.132✓          | µg/Kg | <1.0     |        |             | accept |
| Average        |          | 0.0782          | µg/Kg |          | 0.0484 |             |        |

QA Comments:

# QA Summary Report

Batch Number:

Method Number: EPA 1631E

Project Number(s): TISSUES

Instrument ID: K-AFS-04

Date Analyzed: 8/30/18

Analyst Name: Anna Boyer

| Bias and Precision |              |              |       |             |               |        |             |      |           |        |
|--------------------|--------------|--------------|-------|-------------|---------------|--------|-------------|------|-----------|--------|
| Type               | Name/ID      | Final Result | Units | Spike Level | Source Result | % REC  | % REC Limit | RPD  | RPD Limit | Notes  |
| MS                 | K1807185-006 | 622          | µg/Kg | 249         | 347           | 110.   | 70-130      |      |           | accept |
|                    | K1807189-006 | 597 ✓        | µg/Kg | 248         | 326           | 109    | 70-130      |      |           | accept |
| MSD                | K1807185-006 | 568          | µg/Kg | 249         | 347           | 88.8   | 70-130      | 9.08 | < 30      | accept |
|                    | K1807189-006 | 561 ✓        | µg/Kg | 250         | 326           | 94.0   | 70-130      | 6.17 | < 30      | accept |
| SRM                | TORT-3       | 274 ✓        | µg/Kg | 292         |               | 94.0 ✓ | 70-130      |      |           | accept |
| OPR                | OPR-1        | 5.50 ✓       | µg/Kg | 5.0         |               | 110. ✓ | 70-130      |      |           | accept |
|                    | OPR-2        | 5.40 ✓       | µg/Kg | 5.0         |               | 108 ✓  | 70-130      |      |           | accept |
| VER                | VER-1        | 5.08 ✓       | µg/Kg | 5.0         |               | 102 ✓  | 77-123      |      |           | accept |
|                    | VER-2        | 5.56 ✓       | µg/Kg | 5.0         |               | 111 ✓  | 77-123      |      |           | accept |
|                    | VER-3        | 4.84 ✓       | µg/Kg | 5.0         |               | 96.9 ✓ | 77-123      |      |           | accept |

# Run Report

Batch Number:

Method Number: EPA 1631E

Project Number(s): TISSUES

Instrument ID: K-AFS-04

Date Analyzed: 8/30/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID           | Method<br>Blank | Peak | Peak Area     | Analyzed Result<br>(pg) | Final Result<br>(µg/Kg) | QA Results | Criteria | Notes  |
|-----|------|------|-------------------|-----------------|------|---------------|-------------------------|-------------------------|------------|----------|--------|
| 1   | X    | CCB  | RINSE             |                 | 1    | 58,980        | 2.63                    |                         | 2.63       | < 50     | accept |
| 2   | Y    | CCB  | RINSE             |                 | 1    | 38,178        | 0.534                   |                         | 0.534      | < 50     | accept |
| 3   | X    | CB   | CB-1              |                 | 1    | 29,036 ✓      | 2.92                    |                         | 2.92       | < 50     | accept |
| 4   | Y    | CB   | CB-2              |                 | 1    | 35,436 ✓      | 3.56                    |                         | 3.56       | < 50     | accept |
| 5   | X    | CB   | CB-3              |                 | 1    | 31,206 ✓      | 3.14                    |                         | 3.14       | < 50     | accept |
| 6   | Y    | CB   | CB-4              |                 | 1    | 35,797 ✓      | 3.60                    |                         | 3.60       | < 50     | accept |
| 7   | X    | STD  | 12.5 pg           |                 | 1    | 154,122 ✓     | 12.2                    |                         | 97.6       | 75-125   | accept |
| 8   | Y    | STD  | 25 pg             |                 | 1    | 297,596 ✓     | 26.6                    |                         | 106        | 75-125   | accept |
| 9   | X    | STD  | 100 pg            |                 | 1    | 996,346 ✓     | 96.9                    |                         | 96.9       | 75-125   | accept |
| 10  | Y    | STD  | 500 pg            |                 | 1    | 5,149,118 ✓   | 515                     |                         | 103        | 75-125   | accept |
| 11  | X    | STD  | 2500 pg           |                 | 1    | 23,845,699 ✓  | 2,390                   |                         | 95.8       | 75-125   | accept |
| 12  | Y    | STD  | 10000 pg          |                 | 1    | 100,651,489 ✓ | 10,100                  |                         | 101        | 75-125   | accept |
| 13  | X    | VER  | VER-1             |                 | 1    | 1,296,711 ✓   | 127 ✓                   | 5.08 ✓                  | 102        | 77-123   | accept |
| 14  | Y    | OPR  | OPR-1             |                 | 1    | 2,769,656 ✓   | 275 ✓                   | 5.50 ✓                  | 110.       | 70-130   | accept |
| 15  | X    | MBA  | MB-1              |                 | 1    | 51,884 ✓      | 1.91                    | 0.0382                  | 0.0382     | <1.0     | accept |
| 16  | Y    | MBA  | MB-2              |                 | 1    | 64,877 ✓      | 3.22                    | 0.0644                  | 0.0644     | <1.0     | accept |
| 17  | X    | SRM  | TORT-3            |                 | 1    | 28,277,104 ✓  | 2,840 ✓                 | 274 ✓                   | 94.0       | 70-130   | accept |
| 18  | X    | S    | K1807185-006      |                 | 1    | 34,764,700    | 3,490                   | 347                     |            | < HS     | accept |
| 19  | Y    | MS   | K1807185-006      |                 | 1    | 62,168,528    | 6,250                   | 622                     | 110.       | 70-130   | accept |
| 20  | X    | MSD  | K1807185-006      |                 | 1    | 56,628,545    | 5,690                   | 568                     | 88.8       | 70-130   | accept |
| 21  | X    | S    | K1807185-006 DUP  |                 | 1    | 33,867,812    | 3,400                   | 339                     |            | < HS     | accept |
| 22  | Y    | S    | K1807185-006 TRIP |                 | 1    | 36,801,374    | 3,700                   | 365                     |            | < HS     | accept |
| 23  | X    | S    | K1807185-012      |                 | 1    | 29,588,829    | 2,970                   | 294                     |            | < HS     | accept |
| 24  | Y    | S    | K1807185-018      |                 | 1    | 41,003,824    | 4,120                   | 402                     |            | < HS     | accept |
| 25  | X    | S    | K1807185-024      |                 | 1    | 34,435,284    | 3,460                   | 345                     |            | < HS     | accept |
| 26  | Y    | S    | K1807185-030      |                 | 1    | 37,433,729    | 3,760                   | 375                     |            | < HS     | accept |
| 27  | X    | S    | K1807185-036      |                 | 1    | 43,437,859    | 4,370                   | 425                     |            | < HS     | accept |
| 28  | Y    | S    | K1807189-012      |                 | 1    | 49,703,281 ✓  | 5,000 ✓                 | 484 ✓                   |            | < HS     | accept |
| 29  | X    | S    | K1807189-018      |                 | 1    | 54,103,216 ✓  | 5,440 ✓                 | 528 ✓                   |            | < HS     | accept |
| 30  | Y    | S    | K1807189-024      |                 | 1    | 60,204,137 ✓  | 6,050 ✓                 | 604 ✓                   |            | < HS     | accept |
| 31  | X    | S    | K1807189-030      |                 | 1    | 41,422,013 ✓  | 4,160 ✓                 | 412 ✓                   |            | < HS     | accept |
| 32  | Y    | VER  | VER-2             |                 | 1    | 1,415,963 ✓   | 139 ✓                   | 5.56 ✓                  | 111        | 77-123   | accept |
| 33  | X    | S    | K1807189-006      |                 | 1    | 32,473,848 ✓  | 3,260 ✓                 | 326 ✓                   |            | < HS     | accept |

# Run Report

Batch Number:

Method Number: EPA 1631E

Project Number(s): TISSUES

Instrument ID: K-AFS-04

Date Analyzed: 8/30/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID      | Method | Peak | Peak Area    | Analyzed Result | Final Result | QA Results | Criteria | Notes  |
|-----|------|------|--------------|--------|------|--------------|-----------------|--------------|------------|----------|--------|
|     |      |      |              | Blank  |      |              | (pg)            | (µg/Kg)      |            |          |        |
| 34  | Y    | MS   | K1807189-006 |        | 1    | 59,840,485 ✓ | 6,010 ✓         | 597 ✓        | 109        | 70-130   | accept |
| 35  | X    | MSD  | K1807189-006 |        | 1    | 55,842,861 ✓ | 5,610 ✓         | 561 ✓        | 94.0       | 70-130   | accept |
| 36  | Y    | S    | K1807189-036 |        | 1    | 97,775,800 ✓ | 9,830 ✓         | 964 ✓        |            | < HS     | accept |
| 37  | X    | MBA  | MB-3         |        | 1    | 98,616 ✓     | 6.61 ✓          | 0.132 ✓      | 0.132      | <1.0     | accept |
| 38  | Y    | OPR  | OPR-2        |        | 1    | 2,715,166 ✓  | 270. ✓          | 5.40 ✓       | 108        | 70-130   | accept |
| 39  | X    | VER  | VER-3        |        | 1    | 1,237,193 ✓  | 121 ✓           | 4.84 ✓       | 96.9       | 77-123   | accept |

## Analyst Comments:

PMT: 521  
 OFFSET: 3,177  
 NOISE: 67  
 VOA Vial Lot # 8-039-001

$$(PA - 32869)(0.000101) - \frac{\sqrt{D}}{\sqrt{S} \cdot \sqrt{A}} = \text{mg/Kg}$$

# Run Information Report

Batch Number:

Method Number: EPA 1631E

Project Number(s): TISSUES

Instrument ID: K-AFS-04

Date Analyzed: 8/30/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID           | Method<br>Blank | Sample<br>Vol/Wt | Dilution<br>Vol (ml) | Analyzed<br>Vol (ml) | Expected<br>Value | Notes |
|-----|------|------|-------------------|-----------------|------------------|----------------------|----------------------|-------------------|-------|
| 1   | X    | CCB  | RINSE             |                 |                  |                      |                      |                   |       |
| 2   | Y    | CCB  | RINSE             |                 |                  |                      |                      |                   |       |
| 3   | X    | CB   | CB-1              |                 |                  |                      |                      |                   |       |
| 4   | Y    | CB   | CB-2              |                 |                  |                      |                      |                   |       |
| 5   | X    | CB   | CB-3              |                 |                  |                      |                      |                   |       |
| 6   | Y    | CB   | CB-4              |                 |                  |                      |                      |                   |       |
| 7   | X    | STD  | 12.5 pg           |                 |                  |                      |                      | 12.5              |       |
| 8   | Y    | STD  | 25 pg             |                 |                  |                      |                      | 25                |       |
| 9   | X    | STD  | 100 pg            |                 |                  |                      |                      | 100               |       |
| 10  | Y    | STD  | 500 pg            |                 |                  |                      |                      | 500               |       |
| 11  | X    | STD  | 2500 pg           |                 |                  |                      |                      | 2500              |       |
| 12  | Y    | STD  | 10000 pg          |                 |                  |                      |                      | 10000             |       |
| 13  | X    | VER  | VER-1             |                 | 25               | 25                   | 25                   | 5.0               |       |
| 14  | Y    | OPR  | OPR-1             |                 | 400              | 40                   | 5.0                  | 5.0               |       |
| 15  | X    | MBA  | MB-1              |                 | 400              | 40                   | 5.0                  |                   |       |
| 16  | Y    | MBA  | MB-2              |                 | 400              | 40                   | 5.0                  |                   |       |
| 17  | X    | SRM  | TORT-3            |                 | 414              | 40                   | 1.0                  | 292               |       |
| 18  | X    | S    | K1807185-006      |                 | 403              | 40                   | 1.0                  |                   |       |
| 19  | Y    | MS   | K1807185-006      |                 | 402              | 40                   | 1.0                  | 249               |       |
| 20  | X    | MSD  | K1807185-006      |                 | 401              | 40                   | 1.0                  | 249               |       |
| 21  | X    | S    | K1807185-006 DUP  |                 | 402              | 40                   | 1.0                  |                   |       |
| 22  | Y    | S    | K1807185-006 TRIP |                 | 405              | 40                   | 1.0                  |                   |       |
| 23  | X    | S    | K1807185-012      |                 | 405              | 40                   | 1.0                  |                   |       |
| 24  | Y    | S    | K1807185-018      |                 | 410              | 40                   | 1.0                  |                   |       |
| 25  | X    | S    | K1807185-024      |                 | 401              | 40                   | 1.0                  |                   |       |
| 26  | Y    | S    | K1807185-030      |                 | 401              | 40                   | 1.0                  |                   |       |
| 27  | X    | S    | K1807185-036      |                 | 411              | 40                   | 1.0                  |                   |       |
| 28  | Y    | S    | K1807189-012      |                 | 413              | 40                   | 1.0                  |                   |       |
| 29  | X    | S    | K1807189-018      |                 | 412              | 40                   | 1.0                  |                   |       |
| 30  | Y    | S    | K1807189-024      |                 | 401              | 40                   | 1.0                  |                   |       |
| 31  | X    | S    | K1807189-030      |                 | 404              | 40                   | 1.0                  |                   |       |
| 32  | Y    | VER  | VER-2             |                 | 25               | 25                   | 25                   | 5.0               |       |
| 33  | X    | S    | K1807189-006      |                 | 400              | 40                   | 1.0                  |                   |       |

## Run Information Report

Batch Number:

Method Number: EPA 1631E

Project Number(s): TISSUES

Instrument ID: K-AFS-04

Date Analyzed: 8/30/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID      | Method<br>Blank | Sample<br>Vol/Wt | Dilution<br>Vol (ml) | Analyzed<br>Vol (ml) | Expected<br>Value | Notes |
|-----|------|------|--------------|-----------------|------------------|----------------------|----------------------|-------------------|-------|
| 34  | Y    | MS   | K1807189-006 |                 | 403              | 40                   | 1.0                  | 248               |       |
| 35  | X    | MSD  | K1807189-006 |                 | 400              | 40                   | 1.0                  | 250               |       |
| 36  | Y    | S    | K1807189-036 |                 | 408              | 40                   | 1.0                  |                   |       |
| 37  | X    | MBA  | MB-3         |                 | 400              | 40                   | 5.0                  |                   |       |
| 38  | Y    | OPR  | OPR-2        |                 | 400              | 40                   | 5.0                  | 5.0               |       |
| 39  | X    | VER  | VER-3        |                 | 25               | 25                   | 25                   | 5.0               |       |



**Tissue Dry Wt. MRL and MDL Calculations:**

Standard MRL = 1.0  
 Standard MDL = 0.09  
 Standard Dilution = 1  
 Standard Sample Mass = 0.400

**Weight & Dilution Adjusted**

| Sample I.D.    | Dry Weight ✓ | Dilution | MRL | MDL  |
|----------------|--------------|----------|-----|------|
| K1807185-006   | 0.4030       | 5        | 5.0 | 0.45 |
| K1807185-006D  | 0.4020       | 5        | 5.0 | 0.45 |
| K1807185-006T  | 0.4050       | 5        | 4.9 | 0.44 |
| K1807185-006S  | 0.4020       | 5        | 5.0 | 0.45 |
| K1807185-006SD | 0.4010       | 5        | 5.0 | 0.45 |
| K1807185-012   | 0.4050       | 5        | 4.9 | 0.44 |
| K1807185-018   | 0.4100       | 5        | 4.9 | 0.44 |
| K1807185-024   | 0.4010       | 5        | 5.0 | 0.45 |
| K1807185-030   | 0.4010       | 5        | 5.0 | 0.45 |
| K1807185-036   | 0.4110       | 5        | 4.9 | 0.44 |
| K1807189-006   | 0.4000       | 5        | 5.0 | 0.45 |
| K1807189-006S  | 0.4030       | 5        | 5.0 | 0.45 |
| K1807189-006SD | 0.4000       | 5        | 5.0 | 0.45 |
| K1807189-012   | 0.4130       | 5        | 4.8 | 0.44 |
| K1807189-018   | 0.4120       | 5        | 4.9 | 0.44 |
| K1807189-024   | 0.4010       | 5        | 5.0 | 0.45 |
| K1807189-030   | 0.4040       | 5        | 5.0 | 0.45 |
| K1807189-036   | 0.4080       | 5        | 4.9 | 0.44 |
|                |              |          |     |      |
|                |              |          |     |      |
|                |              |          |     |      |
|                |              |          |     |      |
|                |              |          |     |      |
|                |              |          |     |      |
| Method Blank   | 0.4000       | 1        | 1.0 | 0.09 |

## Metals Digestion Sheet

|                    |  |                      |  |        |  |  |
|--------------------|--|----------------------|--|--------|--|--|
| StarLims Number:   |  |                      |  | 320435 |  |  |
| Method : 1631EApp. |  | Analysis for : CVAFS |  |        |  |  |

| Sample         | Matrices | Dry | Wet | Initial Weight (g) | Final Volume (ml) | Matrix     |
|----------------|----------|-----|-----|--------------------|-------------------|------------|
| VER-1          | Water    |     | x   | 25ml               | 25ml              | 0.5% BrCl  |
| VER-2          | Water    |     | x   | 25ml               | 25ml              | 0.5% BrCl  |
| Method Blank   |          | x   |     | 0.400              | 40                | 0.02N BrCl |
| Method Blank   |          | x   |     | 0.400              | 40                | 0.02N BrCl |
| Method Blank   |          | x   |     | 0.400              | 40                | 0.02N BrCl |
| OPR-1          |          | x   |     | 0.400              | 40                | 0.02N BrCl |
| TORT-3         |          | x   |     | 0.418              | 40                | 0.02N BrCl |
| K1807185-006   |          |     | x   | 0.403              | 40                | 0.02N BrCl |
| K1807185-012   |          |     | x   | 0.405              | 40                | 0.02N BrCl |
| K1807185-018   |          |     | x   | 0.410              | 40                | 0.02N BrCl |
| K1807185-024   |          |     | x   | 0.401              | 40                | 0.02N BrCl |
| K1807185-030   |          |     | x   | 0.401              | 40                | 0.02N BrCl |
| K1807185-036   |          |     | x   | 0.411              | 40                | 0.02N BrCl |
| K1807189-006   |          |     | x   | 0.400              | 40                | 0.02N BrCl |
| K1807189-012   |          |     | x   | 0.413              | 40                | 0.02N BrCl |
| K1807189-018   |          |     | x   | 0.412              | 40                | 0.02N BrCl |
| K1807189-024   |          |     | x   | 0.401              | 40                | 0.02N BrCl |
| K1807189-030   |          |     | x   | 0.404              | 40                | 0.02N BrCl |
| K1807189-036   |          |     | x   | 0.408              | 40                | 0.02N BrCl |
| K1807185-006S  |          |     | x   | 0.402              | 40                | 0.02N BrCl |
| K1807185-006SD |          |     | x   | 0.401              | 40                | 0.02N BrCl |
| K1807189-006S  |          |     | x   | 0.403              | 40                | 0.02N BrCl |
| K1807189-006SD |          |     | x   | 0.400              | 40                | 0.02N BrCl |
| K1807185-006D  |          |     | x   | 0.402              | 40                | 0.02N BrCl |
| K1807185-006T  |          |     | x   | 0.405              | 40                | 0.02N BrCl |
|                |          |     | x   |                    | 40                | 0.02N BrCl |
|                |          |     | x   |                    | 40                | 0.02N BrCl |
|                |          |     | x   |                    | 40                | 0.02N BrCl |
|                |          |     | x   |                    | 40                | 0.02N BrCl |
|                |          |     | x   |                    | 40                | 0.02N BrCl |
| OPR-2          |          | x   |     | 0.400              | 40                | 0.02N BrCl |
| VER-3          | Water    |     | x   | 25ml               | 25ml              | 0.5% BrCl  |

VOA Vial Lot # 8-039-001

BrCl = AF2-38-F

AF2-38-I (40ppb)  
AF2-38-D (2.5ppb)OPR: 0.05ml.  
QCS: 0.8mL

Digestion Acid Mixture: AF2-38-G

1st MS / DMS: 400.1ml QCS Parent 1ppm AF2-27-D Balance ID: 37  
 2nd MS / DMS: ↓

Comments: TORT-3 Solids: 99.1%

HotBlock: K-Block Digester: 16 Observed Temp: 104°C Correction factor: 0 Corrected Temp: 104°C

Time Digestion Started: 10:30am Dilution Completed: 4:00pm

|                           |                                    |                                        |
|---------------------------|------------------------------------|----------------------------------------|
| Analyst <u>Anna Beyer</u> | Date <u>3/22/18</u> <u>3/29/18</u> | <u>weighed</u> <u>weighed/digested</u> |
|---------------------------|------------------------------------|----------------------------------------|

1631Dig.XLS  
06/17/04

ALS Group USA, Corp.  
dba ALS Environmental  
Analytical Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish tissue

**Service Request:** K1807189  
**Date Collected:** 07/25-26/18  
**Date Received:** 07/28/18

Total Inorganic Arsenic

**Prep Method:** Method  
**Analysis Method:** 1632A  
**Test Notes:**

**Units:** ug/g  
**Basis:** Dry

| Sample Name    | Lab Code     | MRL   | MDL   | Dilution<br>Factor | Date<br>Extracted | Date<br>Analyzed | Result | Result<br>Notes |
|----------------|--------------|-------|-------|--------------------|-------------------|------------------|--------|-----------------|
| EPA-NP-B1      | K1807189-006 | 0.02  | 0.007 | 1                  | 08/29/18          | 08/30/18         | ND     |                 |
| EPA-NP-B2      | K1807189-012 | 0.019 | 0.007 | 1                  | 08/29/18          | 08/30/18         | ND     |                 |
| EPA-NP-B3      | K1807189-018 | 0.02  | 0.007 | 1                  | 08/29/18          | 08/30/18         | ND     |                 |
| EPA-NP-B4      | K1807189-024 | 0.02  | 0.007 | 1                  | 08/29/18          | 08/30/18         | ND     |                 |
| EPA-NP-B5      | K1807189-030 | 0.019 | 0.007 | 1                  | 08/29/18          | 08/30/18         | ND     |                 |
| EPA-NP-B6      | K1807189-036 | 0.019 | 0.007 | 1                  | 08/29/18          | 08/30/18         | ND     |                 |
| Method Blank 1 | K1807189-MB1 | 0.02  | 0.007 | 1                  | 08/29/18          | 08/30/18         | ND     |                 |
| Method Blank 2 | K1807189-MB2 | 0.02  | 0.007 | 1                  | 08/29/18          | 08/30/18         | ND     |                 |
| Method Blank 3 | K1807189-MB3 | 0.02  | 0.007 | 1                  | 08/29/18          | 08/30/18         | ND     |                 |

**ALS Group USA, Corp.**  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish tissue

**Service Request:** K1807189  
**Date Collected:** 07/26/18  
**Date Received:** 07/28/18  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30/18

Total Metals  
Matrix Spike/Duplicate Matrix Spike Summary

**Sample Name:** EPA-NP-B1 ✓  
**Lab Code:** K1807189-006MS, K1807189-006DMS  
**Test Notes:**

**Units:** ug/g  
**Basis:** Dry

| Analyte           | Prep Method | Analysis Method | MRL  | Spike Level |       | Sample Result | Spike Result |       | Percent Recovery |      | Method Acceptance Limits | Relative Percent Difference | Result Notes |
|-------------------|-------------|-----------------|------|-------------|-------|---------------|--------------|-------|------------------|------|--------------------------|-----------------------------|--------------|
|                   |             |                 |      | MS          | DMS   |               | MS           | DMS   | MS               | DMS  |                          |                             |              |
| Inorganic Arsenic | Method      | 1632A           | 0.08 | 0.592       | 0.598 | ND ✓          | 0.180 ✓      | 0.190 | 30 ✓             | 32 ✓ | 50-150                   | 5                           | N            |

JS all

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish tissue

**Service Request:** K1807189  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30/18

Triplicate Summary  
Metals

**Sample Name:** Batch QC  
**Lab Code:** K1807185-036TRP  
**Test Notes:**

*Teck  
sample*

**Units:** ug/g  
**Basis:** Dry

| Analyte | Prep<br>Method | Analysis<br>Method | Sample<br>Result | Duplicate<br>Sample<br>Result | Triplicate<br>Sample<br>Result | Average | Relative<br>Standard<br>Deviation | Result<br>Notes |
|---------|----------------|--------------------|------------------|-------------------------------|--------------------------------|---------|-----------------------------------|-----------------|
| Arsenic | METHOD         | 1632               | ND U             | 0.007 J                       | ND U                           | NC      | NC                                |                 |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**LCS Matrix:** Water

**Service Request:** K1807189  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30/18

Ongoing Precision and Recovery (OPR) Sample Summary  
Total Metals

Sample Name: Ongoing Precision and Recovery

Units: ug/g  
Basis: NA

| Analyte           | Prep Method | Analysis Method | True Value | Result | Percent Recovery | ALS                                | Result Notes |
|-------------------|-------------|-----------------|------------|--------|------------------|------------------------------------|--------------|
|                   |             |                 |            |        |                  | Percent Recovery Acceptance Limits |              |
| Inorganic Arsenic | Method      | 1632A           | 0.200      | 0.210  | ✓ 105 ✓          | 50-150                             |              |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**LCS Matrix:** Water

**Service Request:** K1807189  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30/18

Calibration Verification (CALVER) Sample Summary  
Total Metals

Sample Name: CALVER 1

Units: ug/L  
Basis: NA

Test Notes:

| Analyte           | Prep Method | Analysis Method | True Value | Result  | Percent Recovery | ALS                                | Result Notes |
|-------------------|-------------|-----------------|------------|---------|------------------|------------------------------------|--------------|
|                   |             |                 |            |         |                  | Percent Recovery Acceptance Limits |              |
| Inorganic Arsenic | NA          | 1632A           | 0.20       | 0.192 ✓ | 96 ✓             | 80-120                             |              |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**LCS Matrix:** Water

**Service Request:** K1807189  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30/18

Calibration Verification (CALVER) Sample Summary  
Total Metals

Sample Name: CALVER 2

Units: ug/L  
Basis: NA

Test Notes:

| Analyte           | Prep Method | Analysis Method | True Value | Result  | Percent Recovery | ALS                                | Result Notes |
|-------------------|-------------|-----------------|------------|---------|------------------|------------------------------------|--------------|
|                   |             |                 |            |         |                  | Percent Recovery Acceptance Limits |              |
| Inorganic Arsenic | NA          | 1632A           | 0.20       | 0.194 ✓ | 97 ✓             | 80-120                             |              |



ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**LCS Matrix:** Water

**Service Request:** K1807189  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30/18

Calibration Verification (CALVER) Sample Summary  
Total Metals

Sample Name: CALVER 3

Units: ug/L  
Basis: NA

Test Notes:

| Analyte           | Prep Method | Analysis Method | True Value | Result  | Percent Recovery | ALS                                | Result Notes |
|-------------------|-------------|-----------------|------------|---------|------------------|------------------------------------|--------------|
|                   |             |                 |            |         |                  | Percent Recovery Acceptance Limits |              |
| Inorganic Arsenic | NA          | 1632A           | 0.20       | 0.189 ✓ | 94 ✓             | 80-120                             |              |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**LCS Matrix:** Water

**Service Request:** K1807189  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 08/29/18  
**Date Analyzed:** 08/30/18

Calibration Verification (CALVER) Sample Summary  
Total Metals

Sample Name: CALVER 4

Units: ug/L  
Basis: NA

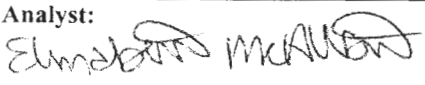
Test Notes:

| Analyte           | Prep Method | Analysis Method | True Value | Result  | Percent Recovery | ALS                                | Result Notes |
|-------------------|-------------|-----------------|------------|---------|------------------|------------------------------------|--------------|
|                   |             |                 |            |         |                  | Percent Recovery Acceptance Limits |              |
| Inorganic Arsenic | NA          | 1632A           | 0.20       | 0.182 ✓ | 91 ✓             | 80-120                             |              |

|                                                                          |                                                                      |
|--------------------------------------------------------------------------|----------------------------------------------------------------------|
| Method 1632: (circle species)<br>(TIA) AsIII MMA DMA<br>Analysis For: As | Service Request # : K1807557, K1807598, K1807987, K1807185, K1807189 |
|--------------------------------------------------------------------------|----------------------------------------------------------------------|

| DATA |                 |                    |                    |                     |                 |             |         |                 |              |
|------|-----------------|--------------------|--------------------|---------------------|-----------------|-------------|---------|-----------------|--------------|
| Pos. | SAMPLE NUMBER   | Initial Sample (g) | Digest Volume (mL) | Aliquot Volume (mL) | Dilution Factor | peak area   | net ng  | net ng/L / ng/g | Comments     |
| 1    | CALBLK 0        | ~                  | ~                  | 50                  | ~               | 41.8680 ✓   | 0.00    | 0.0             |              |
| 2    | 0.5 ng wk std A | ~                  | ~                  | 50                  | ~               | 69.5070 ✓   | 0.54    | 10.8            |              |
| 3    | 10 ng wk std A  | ~                  | ~                  | 50                  | ~               | 546.7110 ✓  | 9.82    | 196.4           |              |
| 4    | 20 ng wk std A  | ~                  | ~                  | 50                  | ~               | 1031.6350 ✓ | 19.25   | 385.0           |              |
| 5    | 30 ng wk std A  | ~                  | ~                  | 50                  | ~               | 1553.9160 ✓ | 29.41   | 588.2           |              |
| 6    | CALBLK 1        | ~                  | ~                  | 50                  | ~               | 34.4310 ✓   | -0.14   | -2.9            |              |
| 7    | CALVER 1        | ~                  | ~                  | 50                  | ~               | 535.1950 ✓  | 9.60 ✓  | 191.9 ✓         | CALVER : 96% |
| 8    | CALBLK 2        | ~                  | ~                  | 50                  | ~               | 60.1020 ✓   | 0.35    | 7.1             |              |
| 9    | OPR             | 0.500              | 10                 | 2.0                 | ~               | 1122.7810 ✓ | 21.02 ✓ | 210.2 ✓         | OPR : 105%   |
| 10   | MB1             | 0.500              | 10                 | 2.0                 | ~               | 71.5950 ✓   | 0.58    | 5.8             |              |
| 11   | MB2             | 0.500              | 10                 | 2.0                 | ~               | 30.0640 ✓   | -0.23   | -2.3            |              |
| 12   | MB3             | 0.500              | 10                 | 2.0                 | ~               | 34.9130 ✓   | -0.14   | -1.4            |              |
| 13   | K1807598-001    | 0.505              | 10                 | 2.0                 | ~               | 104.5110    | 1.22    | 12.1            |              |
| 14   | K1807598-001S   | 0.504              | 10                 | 0.5                 | 4               | 812.8010    | 14.99   | 595.0           | MS : 98%     |
| 15   | K1807598-001SD  | 0.508              | 10                 | 0.5                 | 4               | 807.2560    | 14.89   | 586.1           | MSD : 97%    |
| 16   | K1807557-001    | 0.500              | 10                 | 2.0                 | ~               | 44.8370     | 0.06    | 0.6             |              |
| 17   | K1807557-001S   | 0.519              | 10                 | 0.5                 | 4               | 667.1885    | 12.16   | 468.7           | MS : 81%     |
| 18   | K1807557-001SD  | 0.504              | 10                 | 0.5                 | 4               | 723.7345    | 13.26   | 526.3           | MSD : 88%    |
| 19   | CALVER 2        | ~                  | ~                  | 50                  | ~               | 539.4440 ✓  | 9.68 ✓  | 193.6 ✓         | CALVER : 97% |
| 20   | CALBLK 3        | ~                  | ~                  | 50                  | ~               | 54.3765 ✓   | 0.24    | 4.9             |              |
| 21   | K1807987-001    | 1.643              | 30                 | 2.0                 | ~               | 49.0590     | 0.14    | 1.3             |              |
| 22   | K1807185-006    | 0.507              | 10                 | 2.0                 | ~               | 38.8090     | -0.06   | -0.6            |              |
| 23   | K1807185-006S   | 0.512              | 10                 | 0.5                 | 4               | 378.5605    | 6.55    | 255.8           | MS : 44%     |
| 24   | K1807185-006SD  | 0.502              | 10                 | 0.5                 | 4               | 404.1350    | 7.05    | 280.7           | MSD : 47%    |
| 25   | K1807189-006    | 0.512              | 10                 | 2.0                 | ~               | 40.0360 ✓   | -0.04   | -0.3            |              |

| Comments: | wk std A : AA1-39-C      | Calibration:    | ng  | net peak area | Calibration Factor |          |
|-----------|--------------------------|-----------------|-----|---------------|--------------------|----------|
|           | wk std B : AA1-39-F      |                 | 30  | 1512.0480 ✓   | 50.4016 ✓          |          |
|           | KBH4 : HG-AAS-3-I        |                 | 20  | 989.7670 ✓    | 49.4884 ✓          |          |
|           | 4.8M HCl : HG-AAS-5-D    |                 | 10  | 504.8430 ✓    | 50.4843 ✓          |          |
|           | Tris-Buffer : HG-AAS-5-B |                 | 0.5 | 27.6390 ✓     | 55.2780 ✓          |          |
|           | K7598-001S=595           | K7598-001SD=591 |     |               |                    |          |
|           | K7557-001S=578           | K7557-001SD=595 |     |               | 51.4131 ✓          | CF mean  |
|           | K7175-006S=586           | K7175-006SD=598 |     |               | 2.62 ✓             | CF Stdev |
|           | CALVER/MS/MSD :          |                 |     |               | 5.09 ✓             | RSD      |

|                                                                                              |                 |                     |
|----------------------------------------------------------------------------------------------|-----------------|---------------------|
| Analyst:  | Date: 8/30/18 ✓ | Page Number: 1 of 2 |
|----------------------------------------------------------------------------------------------|-----------------|---------------------|

|                                                                 |                                                                      |
|-----------------------------------------------------------------|----------------------------------------------------------------------|
| Method 1632: (circle species)<br>TIA <sub>s</sub> AsIII MMA DMA | Service Request # : K1807557, K1807598, K1807987, K1807185, K1807189 |
| Analysis For: As                                                |                                                                      |

[illegible]

|              |                          |                |  |                 |  |
|--------------|--------------------------|----------------|--|-----------------|--|
| Calibration: | wk std A : AA1-39-C      |                |  |                 |  |
|              | wk std B : AA1-39-F      |                |  |                 |  |
|              | KBH4 : HG-AAS-3-I        | K7189-006S=592 |  | K7189-006SD=598 |  |
|              | 4.8M HCl : HG-AAS-5-D    |                |  |                 |  |
|              | Tris-Buffer : HG-AAS-5-B |                |  |                 |  |
|              |                          |                |  |                 |  |
|              |                          |                |  |                 |  |
|              |                          |                |  |                 |  |
|              | CALVER/MS/MSD :          |                |  |                 |  |

|                                       |                         |                               |
|---------------------------------------|-------------------------|-------------------------------|
| Analyst:<br><i>Elmendorf McKinnon</i> | Date:<br><i>8/30/18</i> | Page Number:<br><i>2 of 2</i> |
|---------------------------------------|-------------------------|-------------------------------|

**Tissue Dry Wt. MRL and MDL Calculations:**

Standard MRL = 0.02  
 Standard MDL = 0.007  
 Standard Dilution = 1  
 Standard Sample Mass = 0.500

**Weight & Dilution Adjusted**

| Sample I.D.    | Dry Weight ✓ | Dilution | MRL   | MDL   |
|----------------|--------------|----------|-------|-------|
| K1807557-001   | 0.5000       | 1        | 0.020 | 0.007 |
| K1807557-001S  | 0.5190       | 4        | 0.077 | 0.027 |
| K1807557-001SD | 0.5040       | 4        | 0.079 | 0.028 |
| K1807987-001   | 1.6430       | 1        | 0.006 | 0.002 |
| K1807598-001   | 0.5050       | 1        | 0.020 | 0.007 |
| K1807598-001S  | 0.5040       | 4        | 0.079 | 0.028 |
| K1807598-001SD | 0.5080       | 4        | 0.079 | 0.028 |
| K1807185-006   | 0.5070       | 1        | 0.020 | 0.007 |
| K1807185-006S  | 0.5120       | 4        | 0.078 | 0.027 |
| K1807185-006SD | 0.5020       | 4        | 0.080 | 0.028 |
| K1807185-012   | 0.5010       | 1        | 0.020 | 0.007 |
| K1807185-018   | 0.5060       | 1        | 0.020 | 0.007 |
| K1807185-024   | 0.5020       | 1        | 0.020 | 0.007 |
| K1807185-030   | 0.5050       | 1        | 0.020 | 0.007 |
| K1807185-036   | 0.5050       | 1        | 0.020 | 0.007 |
| K1807185-036D  | 0.5040       | 1        | 0.020 | 0.007 |
| K1807185-036T  | 0.5020       | 1        | 0.020 | 0.007 |
| K1807189-006   | 0.5120       | 1        | 0.020 | 0.007 |
| K1807189-006S  | 0.5070       | 4        | 0.079 | 0.028 |
| K1807189-006SD | 0.5020       | 4        | 0.080 | 0.028 |
| K1807189-012   | 0.5130       | 1        | 0.019 | 0.007 |
| K1807189-018   | 0.5010       | 1        | 0.020 | 0.007 |
| K1807189-024   | 0.5060       | 1        | 0.020 | 0.007 |
| K1807189-030   | 0.5130       | 1        | 0.019 | 0.007 |
| K1807189-036   | 0.5130       | 1        | 0.019 | 0.007 |
| Method Blank   | 0.5000       | 1        | 0.020 | 0.007 |

|                                                                             |                                   |
|-----------------------------------------------------------------------------|-----------------------------------|
| Service Request Number(s): K1807557, K1807598, K1807987, K1807185, K1807189 | Prep. Run Number: 321043 / 321044 |
| Analysis for: Tissue Extraction for TIAs                                    |                                   |

**DATA**

| SR #           | Sample ID | Freeze Dried Sample (g) | Extraction Sol'n | Amount of Extraction Sol'n (mL) |
|----------------|-----------|-------------------------|------------------|---------------------------------|
| OPR            |           | 0.500                   | 2M HCl           | 10                              |
| MB1            |           | 0.500                   | 2M HCl           | 10                              |
| MB2            |           | 0.500                   | 2M HCl           | 10                              |
| MB3            |           | 0.500                   | 2M HCl           | 10                              |
| K1807557-001   |           | 0.500                   | 2M HCl           | 10                              |
| K1807557-001S  |           | 0.519                   | 2M HCl           | 10                              |
| K1807557-001SD |           | 0.504                   | 2M HCl           | 10                              |
| K1807987-001   |           | 1.643                   | 2M HCl           | 30 <del>10</del> 5m 3/27/18     |
| K1807598-001   |           | 0.505                   | 2M HCl           | 10                              |
| K1807598-001S  |           | 0.504                   | 2M HCl           | 10                              |
| K1807598-001SD |           | 0.508                   | 2M HCl           | 10                              |
| K1807185-006   |           | 0.507                   | 2M HCl           | 10                              |
| K1807185-006S  |           | 0.512                   | 2M HCl           | 10                              |
| K1807185-006SD |           | 0.502                   | 2M HCl           | 10                              |
| K1807185-012   |           | 0.501                   | 2M HCl           | 10                              |
| K1807185-018   |           | 0.506                   | 2M HCl           | 10                              |
| K1807185-024   |           | 0.502                   | 2M HCl           | 10                              |
| K1807185-030   |           | 0.505                   | 2M HCl           | 10                              |
| K1807185-036   |           | 0.505                   | 2M HCl           | 10                              |
| K1807189-006   |           | 0.512                   | 2M HCl           | 10                              |
| K1807189-006S  |           | 0.507                   | 2M HCl           | 10                              |
| K1807189-006SD |           | 0.502                   | 2M HCl           | 10                              |
| K1807189-012   |           | 0.513                   | 2M HCl           | 10                              |
| K1807189-018   |           | 0.501                   | 2M HCl           | 10                              |
| K1807189-024   |           | 0.506                   | 2M HCl           | 10                              |
| K1807189-030   |           | 0.513                   | 2M HCl           | 10                              |
| K1807189-036   |           | 0.513                   | 2M HCl           | 10                              |
| K1807185-036D  |           | 0.504                   |                  |                                 |
|                |           | 0.502                   |                  |                                 |

2M HCl Lot #: HG-AAS-26-I

MS/MSD: 0.15mL AA1-39-G

OPR: 0.05mL AA1-39-G

Comments: K-B21-37

Analyst: Elmber mallas 8/27/18 ✓

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Analytical Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish Tissue  
**Analysis Method:** Calculation  
**Prep Method:** None

**Service Request:** K1807189  
**Date Collected:** 07/25/18 - 07/26/18  
**Date Received:** 07/28/18

**Units:** Percent  
**Basis:** Wet

Moisture

| Sample Name | Lab Code     | Result | MRL | MDL | Dil. | Date Analyzed  | Q |
|-------------|--------------|--------|-----|-----|------|----------------|---|
| EPA-NP-B1   | K1807189-006 | 79.3 ✓ | -   | -   | 1    | 08/27/18 16:30 | ✓ |
| EPA-NP-B2   | K1807189-012 | 78.5 ✓ | -   | -   | 1    | 08/27/18 16:30 |   |
| EPA-NP-B3   | K1807189-018 | 78.8 ✓ | -   | -   | 1    | 08/27/18 16:30 |   |
| EPA-NP-B4   | K1807189-024 | 78.7 ✓ | -   | -   | 1    | 08/27/18 16:30 |   |
| EPA-NP-B5   | K1807189-030 | 78.6 ✓ | -   | -   | 1    | 08/27/18 16:30 |   |
| EPA-NP-B6   | K1807189-036 | 78.1 ✓ | -   | -   | 1    | 08/27/18 16:30 |   |

**ALS Group USA, Corp.**

dba ALS Environmental

## QA/QC Report

**Client:** Teck American Incorporated  
**Project** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish Tissue

**Service Request:** K1807189**Date Collected:** 07/26/18**Date Received:** 07/28/18**Date Analyzed:** 08/27/18**Replicate Sample Summary****Inorganic Parameters**

**Sample Name:** EPA-NP-B1 ✓  
**Lab Code:** K1807189-006

**Units:** Percent**Basis:** Wet

| Analyte Name | Analysis Method | MRL | MDL | Sample Result | Duplicate Sample<br>K1807189-006DUP | Average | RPD | RPD Limit |
|--------------|-----------------|-----|-----|---------------|-------------------------------------|---------|-----|-----------|
|              |                 |     |     |               | Result                              |         |     |           |
| Total Solids | Freeze Dry      | -   | -   | 20.7 ✓        | 21.1 ✓                              | 20.9    | 2 ✓ | 20        |

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Printed 09/06/18 10:23:47 AM

Superset Reference:18-0000474949 rev 00



# Benchsheet

Service Request #: K1807189, KQ1810545  
 Test: Frz Dry  
 Method: Frz Dry

Run #: 601131  
 Balance ID: K-Balance-21B

| Matrix      | Lab Code        | Tare (g) | Wet Wt. (g) | Tare + Dry Wt. (g) | Dry Weight (g) | % Total Solids | RPD |
|-------------|-----------------|----------|-------------|--------------------|----------------|----------------|-----|
| Fish Tissue | K1807189-006    | 34.363   | 22.297      | 38.970             | 4.61 ✓         | 20.7 ✓         |     |
| Fish Tissue | K1807189-006DUP | 33.935   | 21.357      | 38.435             | 4.50 ✓         | 21.1 ✓         | 2 ✓ |
| Fish Tissue | K1807189-012    | 33.940   | 23.216      | 38.927             | 4.99 ✓         | 21.5 ✓         |     |
| Fish Tissue | K1807189-018    | 33.654   | 21.107      | 38.123             | 4.47 ✓         | 21.2 ✓         |     |
| Fish Tissue | K1807189-024    | 34.212   | 22.774      | 39.069             | 4.86 ✓         | 21.3 ✓         |     |
| Fish Tissue | K1807189-030    | 34.025   | 20.127      | 38.323             | 4.30 ✓         | 21.4 ✓         |     |
| Fish Tissue | K1807189-036    | 34.138   | 20.766      | 38.692             | 4.55 ✓         | 21.9 ✓         |     |

FreezeDryer ID: FreezeDry      Date In: 08/27/18      Time In: 16:30 ✓      Date Out: 08/28/18      Time Out: 15:00      Thermometer ID:

Cal EQID      Cal Start Value      Cal End Value      Start Date      Start Time      End Date      End Time

Comments: Data entered 8-28-18 and 8-30-18 L.J. Reviewed 8/30/18 A.B.

## ALS, Kelso

## Analytical Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish tissue

**Service Request:** K1807189  
**Date Collected:** 7/25-7/26/2018  
**Date Received:** 7/28/2018

## Lipids, Total

**Prep Method:** EPA 3541  
**Analysis Method:** NOAA  
**Test Notes:**

**Units:** PERCENT  
**Basis:** As Received

| Sample Name  | Lab Code        | MRL  | Date<br>Extracted | Date<br>Analyzed | Result | Result<br>Notes |
|--------------|-----------------|------|-------------------|------------------|--------|-----------------|
| EPA-NP-B1    | K1807189-006    | 0.25 | 9/5/2018 ✓        | 9/11/2018 ✓      | 0.35 ✓ |                 |
| EPA-NP-B2    | K1807189-012    | 0.24 | 9/5/2018          | 9/11/2018        | 0.43 ✓ |                 |
| EPA-NP-B3    | K1807189-018    | 0.25 | 9/5/2018          | 9/11/2018        | 0.62 ✓ |                 |
| EPA-NP-B4    | K1807189-024    | 0.24 | 9/5/2018          | 9/11/2018        | 0.49 ✓ |                 |
| EPA-NP-B5    | K1807189-030    | 0.24 | 9/5/2018          | 9/11/2018        | 0.64 ✓ |                 |
| EPA-NP-B6    | K1807189-036    | 0.24 | 9/5/2018          | 9/11/2018        | 0.66 ✓ |                 |
| Method Blank | KQ1812195-06 MB | 0.24 | 9/5/2018          | 9/11/2018        | 0.24   | U ✓             |

Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

1A/092099p

ALS, Kelso

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Sample Matrix:** Fish tissue

**Service Request:** K1807189  
**Date Collected:** 7/26/2018  
**Date Received:** 7/28/2018  
**Date Extracted:** 9/5/2018  
**Date Analyzed:** 9/11/2018

Triplicate Summary  
Lipids, Total

**Sample Name:** EPA-NP-B1 ✓  
**Lab Code:** K1807189-006 TRP  
**Test Notes:**

**Units:** PERCENT  
**Basis:** As Received

| Analyte       | Prep Method | Analysis Method | MRL  | Sample Result | Duplicate Sample Result | Triplicate Sample Result | Average | Percent Relative Standard Deviation | Result Notes |
|---------------|-------------|-----------------|------|---------------|-------------------------|--------------------------|---------|-------------------------------------|--------------|
| Lipids, Total | EPA 3541    | NOAA            | 0.25 | 0.35 ✓        | 0.35 ✓                  | 0.47 ✓                   | 0.39    | 18.6 ✓                              |              |

Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

DUP/091599p

ALS, Kelso

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study/SFP-139A  
**Matrix:** Tissue

**Service Request:** K1807189  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 9/5/2018  
**Date Analyzed:** 9/11/2018

Laboratory Control Sample  
Lipids, Total

Sample Name: KQ1812195-05 LCS

Units: % (percent)  
Basis: Wet Weight

Test Notes:

| Analyte       | Prep<br>Method | Analysis<br>Method | Spike Level<br>Percent | Result | CAS<br>Advisory<br>Limits | Result<br>Notes |
|---------------|----------------|--------------------|------------------------|--------|---------------------------|-----------------|
| Lipids, Total | EPA 3541       | NOAA               | 100                    | 101 ✓  | 70-130                    |                 |

Approved By: \_\_\_\_\_ Date: \_\_\_\_\_  
LCS (44)/091898p

| wo #             | wet wt | dish   | dish/lip | % lip    | mb corr | % lipids<br>(rounded) | MRL  |
|------------------|--------|--------|----------|----------|---------|-----------------------|------|
| K1807189-006     | 2.029  | 1.2829 | 1.2843   | 0.344998 | 0.0000  | 0.35 ✓                | 0.25 |
| K1807189-012     | 2.087  | 1.2915 | 1.2933   | 0.431241 | 0.0000  | 0.43 ✓                | 0.24 |
| K1807189-018     | 2.014  | 1.3076 | 1.3101   | 0.620655 | 0.0000  | 0.62 ✓                | 0.25 |
| K1807189-024     | 2.041  | 1.3159 | 1.3179   | 0.489956 | 0.0000  | 0.49 ✓                | 0.24 |
| K1807189-030     | 2.041  | 1.3124 | 1.3150   | 0.636943 | 0.0000  | 0.64 ✓                | 0.24 |
| K1807189-036     | 2.048  | 1.2766 | 1.2793   | 0.659180 | 0.0000  | 0.66 ✓                | 0.24 |
| KQ1812195-06 MB  | 2.087  | 1.2863 | 1.2863   | 0.000000 | 0.0000  | 0.00                  | 0.24 |
| K1807189-006 DUP | 2.017  | 1.2834 | 1.2848   | 0.347050 | 0.0000  | 0.35 ✓                | 0.25 |
| K1807189-006 TRP | 2.004  | 1.2792 | 1.2811   | 0.474052 | 0.0000  | 0.47 ✓                | 0.25 |
| KQ1812195-05 LCS | 0.934  | 1.3065 | 1.4950   | 100.9101 | 0.0000  | 101 ✓                 | 0.54 |

# Lipids Raw Benchsheet

| Lab ID           | Client ID                 | Sample Weight (g) | Wt. Dish (g) | Wt. Dish + Lipid (g) |
|------------------|---------------------------|-------------------|--------------|----------------------|
| K1807189-006     | EPA-NP-B1                 | 2.029             | 1.2829       | 1.2843               |
| K1807189-012     | EPA-NP-B2                 | 2.087             | 1.2915       | 1.2933               |
| K1807189-018     | EPA-NP-B3                 | 2.014             | 1.3076       | 1.3101               |
| K1807189-024     | EPA-NP-B4                 | 2.041             | 1.3159       | 1.3179               |
| K1807189-030     | EPA-NP-B5                 | 2.041             | 1.3124       | 1.3150               |
| K1807189-036     | EPA-NP-B6                 | 2.048             | 1.2766       | 1.2793               |
| KQ1812195-06 MB  | Method Blank              | 2.087             | 1.2863       | 1.2863               |
| K1807189-006 DUP | Sample Duplicate          | 2.017             | 1.2834       | 1.2848               |
| K1807189-006 TRP | Sample Triplicate         | 2.004             | 1.2792       | 1.2811               |
| KQ1812195-05 LCS | Laboratory Control Sample | 0.934             | 1.3065       | 1.4950               |

|                                                  |                                       |
|--------------------------------------------------|---------------------------------------|
| Extraction Start Time/Date: <u>09:33 9/15/18</u> | Extraction Method: <u>3541</u>        |
| Extraction Stop Time/Date: <u>13:52 9/15/18</u>  | DCM Lot #: <u>DW264</u>               |
| Extracted By: <u>KRP</u>                         | Sulfate Lot #: <u>175176</u>          |
| Intermediate Volume of Extracts: <u>10mL</u>     | Aliquot used for % Lipids: <u>2mL</u> |
| Date Analyzed: <u>9/15/18</u>                    | Balance ID: <u>K-Balance 40</u>       |
| Analyzed By: <u>Williams</u>                     |                                       |

Prep Run #: 321177

Reviewed By: \_\_\_\_\_

Date: 9/15/18

# Preparation Information Benchsheet

Prep Run#: 321177  
 Team: Semiviva GC/KPRESCOTT  
 Number of Copies to make: 2

Prep Workflow: OrgExtT(14)  
 Prep Method: EPA 3540C

Status: Draft  
 Prep Date/Time: 9/4/18 01:11 PM

| #  | Lab Code     | Client ID        | B# | ✓   | Method /Test          | Matrix      | Amt. Ext. | pH | Int. Vol<br>mls | Final Vol<br>mls | Surr Amt<br>µl | Spike Amt<br>µl |
|----|--------------|------------------|----|-----|-----------------------|-------------|-----------|----|-----------------|------------------|----------------|-----------------|
| 1  | K1807185-006 | EPA-NP-A1        | 3F | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.013     | NA | 10              | 2                | -              | -               |
| 2  | K1807185-012 | EPA-NP-A2        | 9A | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.021     |    | 10              | 2                | -              | -               |
| 3  | K1807185-018 | EPA-NP-A3        | 9B | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.006     |    | 10              | 2                | -              | -               |
| 4  | K1807185-024 | EPA-NP-A4        | 9C | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.057     |    | 10              | 2                | -              | -               |
| 5  | K1807185-030 | EPA-NP-A5        | 9D | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.059     |    | 10              | 2                | -              | -               |
| 6  | K1807185-036 | EPA-NP-A6        | 9E | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.008     |    | 10              | 2                | -              | -               |
| 7  | K1807189-006 | EPA-NP-B1        | 9F | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.029     |    | 10              | 2                | -              | -               |
| 8  | K1807189-012 | EPA-NP-B2        | 7B | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.087     |    | 10              | 2                | -              | -               |
| 9  | K1807189-018 | EPA-NP-B3        | 7C | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.014     |    | 10              | 2                | -              | -               |
| 10 | K1807189-024 | EPA-NP-B4        | 7D | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.041     |    | 10              | 2                | -              | -               |
| 11 | K1807189-030 | EPA-NP-B5        | 7E | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.041     |    | 10              | 2                | -              | -               |
| 12 | K1807189-036 | EPA-NP-B6        | 7F | .02 | ✓ NOAA LIPID / LIPIDS | Fish Tissue | 2.048     |    | 10              | 2                | -              | -               |
| 13 | KQ1812195-01 | K1807185-006 DUP | 8A | .02 | ✓ NOAA LIPID / LIPIDS | Tissue      | 2.022     |    | 10              | 2                | -              | -               |
| 14 | KQ1812195-02 | K1807185-006 TRP | 8B | .02 | ✓ NOAA LIPID / LIPIDS | Tissue      | 2.015     |    | 10              | 2                | -              | -               |
| 15 | KQ1812195-03 | K1807189-006 DUP | 8C | .02 | ✓ NOAA LIPID / LIPIDS | Tissue      | 2.017     |    | 10              | 2                | -              | -               |
| 16 | KQ1812195-04 | K1807189-006 TRP | 8D | .02 | ✓ NOAA LIPID / LIPIDS | Tissue      | 2.004     |    | 10              | 2                | -              | -               |
| 17 | KQ1812195-05 | LCS              | 8E | -   | NOAA LIPID / LIPIDS   | Tissue      | 0.934     |    | 10              | 2                | -              | 1000            |
| 18 | KQ1812195-06 | MB               | 8F | -   | NOAA LIPID / LIPIDS   | Tissue      | 2.087     |    | 10              | 2                | -              | -               |

Comments: ① Samples fell through the thimble during extraction. KRD 09/05/18.

Surrogate ID: \_\_\_\_\_

Spike ID: SVMP-005-60C XP:01/29/19 1000µl spp. HF

Witnessed By: \_\_\_\_\_

Analyst: Kali Rae Prescott

Assisted By: \_\_\_\_\_

Service Request Number(s):

K1807189

## TISSUE HOMOGENIZATION

| Laboratory ID | Weight of Sample* (g) | Tare of Jar (g) |  |  |  | matrix |
|---------------|-----------------------|-----------------|--|--|--|--------|
| K1807189 - 1  | 115.117               | 202.066         |  |  |  | fish   |
| - 2           | 140.085               | 202.755         |  |  |  |        |
| - 3           | 106.693               | 202.505         |  |  |  |        |
| - 4           | 118.483               | 202.515         |  |  |  |        |
| - 5           | ① 436.329             | 306.928         |  |  |  |        |
| - 7           | 94.478                | 202.708         |  |  |  |        |
| - 8           | 94.587                | 201.891         |  |  |  |        |
| - 9           | 118.298               | 201.914         |  |  |  |        |
| - 10          | 177.030               | 202.013         |  |  |  |        |
| - 11          | 501                   | 476             |  |  |  |        |
| - 13          | 132.009               | 202.060         |  |  |  |        |
| - 14          | 96.603                | 202.051         |  |  |  |        |
| - 15          | 162.213               | 201.987         |  |  |  |        |
| - 16          | 390                   | 476             |  |  |  |        |
| - 17          | 541                   | 471             |  |  |  |        |
| - 19          | 135.820               | 202.194         |  |  |  |        |
| - 20          | 119.690               | 202.085         |  |  |  |        |
| - 21          | 131.835               | 202.656         |  |  |  |        |
| - 22          | 265                   | 307             |  |  |  |        |
| - 23          | 454                   | 476             |  |  |  |        |
| - 25          | 116.390               | 202.234         |  |  |  |        |
| - 26          | 133.808               | 202.577         |  |  |  |        |
| - 27          | ① 8116.261            | 202.597         |  |  |  |        |
| - 28          | 182.900               | 202.028         |  |  |  |        |
| - 29          | 340                   | 309             |  |  |  |        |

Comments:

OCS 8/21/18 OCS 8/24/18

\* The weight of sample is after homogenization.

Balance ID: K-Balances 213 / Balance #1

Date Balance Checked: 8/21/18 8/22/18 8/24/18

Analyst: G. S. S. S.

Date: 8/21/18 8/22/18 8/24/18

Reviewed:

Date: 8/28/18



## TISSUE HOMOGENIZATION

[illegible]

Comments: (1) K1807189-25 = 2x32 oz jars marked A and B

\* The weight of sample is after homogenization.

Balance ID: KBalance 213 / Balance #1

Date Balance Checked: 8/24/08

Analyst: G. Bentley

Date: 8/24/18

Reviewed:

Date: 8/28/20

ALS Inc.

Service Request Number(s):

21807189

Rinsate and Homogenization Blank Data

| Laboratory ID        | Amount (mL)      | Date    | Time  | Preservative |
|----------------------|------------------|---------|-------|--------------|
| Rinsate Blank        | 125/250/500/1000 | 8/24/18 | 08:55 | See below    |
| Homogenization Blank | ↓                | ↓       | 11:45 |              |
| Homogenization Blank | ↓                | ↓       | 13:00 |              |

Comments: 1030 125ml HCl / 1032 250ml HCl / 500ml water / 5HNO<sub>3</sub> / 1 L Amber nore

|                         |               |
|-------------------------|---------------|
| Analyst: <i>Beating</i> | Date: 8/24/18 |
| Reviewed: <i>H</i>      | Date: 8/28/18 |

ALS Inc.

Service Request Number(s):

K1807189

Analysis for:

FISH FILLET COMPOSITE DATA

| Service Request # | Sample Wt (g) | Homogenized Composite Wt(g) |
|-------------------|---------------|-----------------------------|
| K1807189-001      | 40.195        |                             |
| K1807189-002      | 40.095        |                             |
| K1807189-003      | 40.162        |                             |
| K1807189-004      | 40.124        |                             |
| K1807189-005      | 40.136        |                             |
| K1807189-006      | K1807189-006  | 200.712                     |
| K1807189-007      | 40.072        |                             |
| K1807189-008      | 40.130        |                             |
| K1807189-009      | 40.104        |                             |
| K1807189-010      | 40.058        |                             |
| K1807189-011      | 40.153        |                             |
| K1807189-012      | K1807189-012  | 200.517                     |
| K1807189-013      | 40.147        |                             |
| K1807189-014      | 40.085        |                             |
| K1807189-015      | 40.121        |                             |
| K1807189-016      | 40.173        |                             |
| K1807189-017      | 40.151        |                             |
| K1807189-018      | K1807189-018  | 200.677                     |

Balance ID:

KBalance 45

Date Checked:

8/27/18

Analyst:

G. Brantley

Date:

8/27/18

Reviewed:

7

Date:

8/28/18

ALS Inc.

Service Request Number(s):

K1807189

Analysis for:

FISH FILLET COMPOSITE DATA

| Service Request # | Sample Wt (g) | Homogenized Composite Wt(g) |
|-------------------|---------------|-----------------------------|
| K1807189-019      | 40.096        |                             |
| K1807189-020      | 40.161        |                             |
| K1807189-021      | 40.093        |                             |
| K1807189-022      | 40.176        |                             |
| K1807189-023      | 40.068        |                             |
| K1807189-024      | K1807189-024  | 200.594                     |
| K1807189-025      | 40.073        |                             |
| K1807189-026      | 40.150        |                             |
| K1807189-027      | 40.067        |                             |
| K1807189-028      | 40.128        |                             |
| K1807189-029      | 40.165        |                             |
| K1807189-030      | K1807189-030  | 200.583                     |
| K1807189-031      | 40.132        |                             |
| K1807189-032      | 40.071        |                             |
| K1807189-033      | 40.152        |                             |
| K1807189-034      | 40.111        |                             |
| K1807189-035      | 40.029        |                             |
| K1807189-036      | K1807189-036  | 200.495                     |

Balance ID: K3 Balance 45 Date Checked: 8/27/18

Analyst: E. B. C. Date: 8/27/18  
Reviewed: [Signature] Date: 8/28/18

**C. SERVICE REQUEST K1807597**



## INORGANIC ANALYSIS SUPPORT DOCUMENTATION

ESI project name: Teck UCR Northern Pike  
Sample Collection Dates: 8/3 - 8/24/18  
Job Number: 20188280  
Project Manager: Tom Weinmann  
Laboratory: ALS

Reviewed by: THW  
Approved by: AP  
Completion Date: 10/2013

Applicable Sample No's ( x )

Refer to Table 1 in the Quality Assurance Review

Deliverable: CLP (Full) ( )  
Level IV (Full) ( x )  
Limited ( )  
Other:

Sample No.  
K1807597

Lab Control No.

The following table indicates criteria that were examined, the identified problems, and support documentation attachments

|                                         | Criteria Examined in Detail                            |      |       |       |  | Problems Identified                                    |      |       |       |  | Support Documentation Attachments                      |      |       |       |  |
|-----------------------------------------|--------------------------------------------------------|------|-------|-------|--|--------------------------------------------------------|------|-------|-------|--|--------------------------------------------------------|------|-------|-------|--|
|                                         | Check (✓) if Yes or Footnote Letter for Comments Below |      |       |       |  | Check (✓) if Yes or Footnote Letter for Comments Below |      |       |       |  | Check (✓) if Yes or Footnote Letter for Comments Below |      |       |       |  |
|                                         | 6010C/6020A                                            | 7742 | 1631E | 1632A |  | 6010C/6020A                                            | 7742 | 1631E | 1632A |  | 6010C/6020A                                            | 7742 | 1631E | 1632A |  |
| Holding Times                           | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Blank Analysis Results                  | x                                                      | x    | x     | x     |  | x                                                      |      |       |       |  | x                                                      | x    | x     | x     |  |
| Matrix Spike (Predigestion) Results     | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Duplicate Analysis: ( ) Field ( x ) Lab | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Quantitation of Results                 | x                                                      | x    |       |       |  |                                                        |      |       |       |  | x                                                      | x    |       |       |  |
| Detection Limit/Sensitivity             | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Initial Calibrations                    | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Continuing Calibrations                 | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Laboratory Control Standard (LCS)       | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| ICP Linear Range Analysis               | x                                                      |      |       |       |  |                                                        |      |       |       |  | x                                                      |      |       |       |  |
| ICP Interference Checks                 | x                                                      |      |       |       |  |                                                        |      |       |       |  | x                                                      |      |       |       |  |
| ICP Serial Dilutions                    | x                                                      |      |       |       |  |                                                        |      |       |       |  | x                                                      |      |       |       |  |
| ICP Post-Digestion Spike                | x                                                      |      |       |       |  |                                                        |      |       |       |  | x                                                      |      |       |       |  |
| GFAA Post Digestion Spikes              |                                                        |      |       |       |  |                                                        |      |       |       |  |                                                        |      |       |       |  |
| GFAA Duplicate Injections               |                                                        |      |       |       |  |                                                        |      |       |       |  |                                                        |      |       |       |  |
| ICP Multiple Exposures                  |                                                        |      |       |       |  |                                                        |      |       |       |  |                                                        |      |       |       |  |
| GFAA Standard Additions                 |                                                        |      |       |       |  |                                                        |      |       |       |  |                                                        |      |       |       |  |
| CRDL Standards                          | x                                                      | x    |       |       |  |                                                        |      |       |       |  | x                                                      | x    |       |       |  |
| Condition on Receipt                    | x                                                      | x    | x     | x     |  |                                                        |      |       |       |  | x                                                      | x    | x     | x     |  |
| Percent Solids                          |                                                        |      |       |       |  |                                                        |      |       |       |  |                                                        |      |       |       |  |
| Others:                                 |                                                        |      |       |       |  |                                                        |      |       |       |  |                                                        |      |       |       |  |

Comments:

# BLANK ANALYSIS RESULTS FOR INORGANIC PARAMETERS

|                     | Blank Type |     |       |      |       |       |                        |              |                         |                             |
|---------------------|------------|-----|-------|------|-------|-------|------------------------|--------------|-------------------------|-----------------------------|
|                     | Method     |     |       |      |       |       |                        |              |                         |                             |
| Matrix<br>(Aq., S.) | ICB        | CCB | Prep. | Trip | Equip | Field | Blank Sample<br>Number | Contaminant  | Concentration<br>(µg/L) | Qualification<br>limit (5×) |
| Aq                  |            |     |       |      | x     |       | K1807185               | aluminum     | 4                       | 20                          |
|                     |            |     |       |      |       |       |                        | barium       | 0.044                   | 0.22                        |
|                     |            |     |       |      |       |       |                        | calcium      | 14                      | 70                          |
|                     |            |     |       |      |       |       |                        | chromium     | 0.05                    | 0.25                        |
|                     |            |     |       |      |       |       |                        | copper       | 0.39                    | 1.95                        |
|                     |            |     |       |      |       |       |                        | iron         | 9                       | 45                          |
|                     |            |     |       |      |       |       |                        | lead         | 0.034                   | 0.17                        |
|                     |            |     |       |      |       |       |                        | magnesium    | 2.7                     | 13.5                        |
|                     |            |     |       |      |       |       |                        | manganese    | 0.07                    | 0.35                        |
|                     |            |     |       |      |       |       |                        | mercury      | 0.00046                 | 0.0023                      |
|                     |            |     |       |      |       |       |                        | nickel       | 0.22                    | 1.1                         |
|                     |            |     |       |      |       |       |                        | silver       | 0.004                   | 0.02                        |
|                     |            |     |       |      |       |       |                        | sodium       | 40                      | 200                         |
|                     |            |     |       |      |       |       |                        | sulfur       | 10                      | 50                          |
|                     |            |     |       |      |       |       |                        | thallium     | 0.021                   | 0.105                       |
|                     |            |     |       |      |       |       |                        | zinc         | 48                      | 240                         |
|                     |            |     |       |      | x     |       | K1807189               | inorganic As | 0.011                   | 0.055                       |
|                     |            |     |       |      |       |       |                        | aluminum     | 9                       | 45                          |
|                     |            |     |       |      |       |       |                        | barium       | 0.022                   | 0.11                        |
|                     |            |     |       |      |       |       |                        | beryllium    | 0.003                   | 0.015                       |
|                     |            |     |       |      |       |       |                        | calcium      | 25                      | 125                         |
|                     |            |     |       |      |       |       |                        | copper       | 0.13                    | 0.65                        |
|                     |            |     |       |      |       |       |                        | iron         | 9                       | 45                          |
|                     |            |     |       |      |       |       |                        | lead         | 0.011                   | 0.055                       |
|                     |            |     |       |      |       |       |                        | magnesium    | 1.1                     | 5.5                         |
|                     |            |     |       |      |       |       |                        | manganese    | 0.07                    | 0.35                        |
|                     |            |     |       |      |       |       |                        | mercury      | 0.00016                 | 0.0008                      |
|                     |            |     |       |      |       |       |                        | silver       | 0.004                   | 0.02                        |
|                     |            |     |       |      |       |       |                        | zinc         | 2.2                     | 11                          |
|                     |            |     |       |      |       |       |                        |              |                         | 0                           |
|                     |            |     |       |      |       |       |                        |              |                         | 0                           |
|                     |            |     |       |      |       |       |                        |              |                         | 0                           |
|                     |            |     |       |      |       |       |                        |              |                         | 0                           |
|                     |            |     |       |      |       |       |                        |              |                         | 0                           |
|                     |            |     |       |      |       |       |                        |              |                         | 0                           |
|                     |            |     |       |      |       |       |                        |              |                         | 0                           |
|                     |            |     |       |      |       |       |                        |              |                         | 0                           |

Aq = Aqueous; S = Solid

**Notes:**

Rinsate and homogenization blanks associated with each tissue sample Service Request were pooled  
(K1807597-002 through -010 and -020 thru -022 for K1807185 and K1807597-011 through -019 for K1807189)  
and the highest result per analyte was used to evaluate contamination.

Blank contamination was evaluated on a similar unit basis (ppm - i.e. Aq blank result / 1000 vs. tissue result).  
Qualification due to processing blank contamination was not warranted.

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec. Limits |
|--------------------|-----------|--------|-----------------|--------|------------|-------|---------------|
| ICV 08/28/18 11:07 | Selenium  | 7742   | 604386          | 4.14 ✓ | 4.00       | 103 ✓ | 90-120        |
| CCV 08/28/18 11:14 | Selenium  | 7742   | 604386          | 4.09 ✓ | 4.00       | 102 ✓ | 90-110        |
| CCV 08/28/18 11:42 | Selenium  | 7742   | 604386          | 3.99 ✓ | 4.00       | 100 ✓ | 90-110        |
| CCV 08/28/18 12:09 | Selenium  | 7742   | 604386          | 4.20 ✓ | 4.00       | 105 ✓ | 90-110        |
| CCV 08/28/18 12:37 | Selenium  | 7742   | 604386          | 3.96 ✓ | 4.00       | 99 ✓  | 90-110        |
| ICV 08/30/18 11:32 | Antimony  | 6020A  | 604716          | 12.6   | 12.5       | 100   | 90-110        |
|                    | Arsenic   | 6020A  | 604716          | 25.5 ✓ | 25.0       | 102 ✓ | 90-110        |
|                    | Barium    | 6020A  | 604716          | 102    | 100        | 102   | 90-110        |
|                    | Beryllium | 6020A  | 604716          | 2.57   | 2.50       | 103   | 90-110        |
|                    | Cadmium   | 6020A  | 604716          | 12.6   | 12.5       | 101   | 90-110        |
|                    | Chromium  | 6020A  | 604716          | 10.3   | 10.0       | 103   | 90-110        |
|                    | Cobalt    | 6020A  | 604716          | 25.6   | 25.0       | 103   | 90-110        |
|                    | Copper    | 6020A  | 604716          | 12.9   | 12.5       | 103   | 90-110        |
|                    | Lead      | 6020A  | 604716          | 24.6   | 25.0       | 98    | 90-110        |
|                    | Manganese | 6020A  | 604716          | 25.1 ✓ | 25.0       | 100 ✓ | 90-110        |
|                    | Nickel    | 6020A  | 604716          | 25.3   | 25.0       | 101   | 90-110        |
|                    | Silver    | 6020A  | 604716          | 12.7   | 12.5       | 102   | 90-110        |
|                    | Thallium  | 6020A  | 604716          | 24.1   | 25.0       | 96    | 90-110        |
|                    | Uranium   | 6020A  | 604716          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Vanadium  | 6020A  | 604716          | 26.2   | 25.0       | 105   | 90-110        |
|                    | Zinc      | 6020A  | 604716          | 24.7   | 25.0       | 99    | 90-110        |
| CCV 08/30/18 11:37 | Antimony  | 6020A  | 604716          | 12.3   | 12.5       | 98    | 90-110        |
|                    | Arsenic   | 6020A  | 604716          | 25.1   | 25.0       | 100   | 90-110        |
|                    | Barium    | 6020A  | 604716          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Beryllium | 6020A  | 604716          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Cadmium   | 6020A  | 604716          | 24.5 ✓ | 25.0       | 98 ✓  | 90-110        |
|                    | Chromium  | 6020A  | 604716          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Cobalt    | 6020A  | 604716          | 25.1   | 25.0       | 100   | 90-110        |
|                    | Copper    | 6020A  | 604716          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Lead      | 6020A  | 604716          | 24.8   | 25.0       | 99    | 90-110        |



ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec. Limits |
|--------------------|-----------|--------|-----------------|--------|------------|-------|---------------|
| CCV 08/30/18 11:37 | Manganese | 6020A  | 604716          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Nickel    | 6020A  | 604716          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Silver    | 6020A  | 604716          | 12.4 ✓ | 12.5       | 99 ✓  | 90-110        |
|                    | Thallium  | 6020A  | 604716          | 24.4   | 25.0       | 98    | 90-110        |
|                    | Uranium   | 6020A  | 604716          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Vanadium  | 6020A  | 604716          | 25.4   | 25.0       | 101   | 90-110        |
|                    | Zinc      | 6020A  | 604716          | 25.2   | 25.0       | 101   | 90-110        |
| CCV 08/30/18 13:03 | Antimony  | 6020A  | 604716          | 12.5   | 12.5       | 100   | 90-110        |
|                    | Arsenic   | 6020A  | 604716          | 24.9   | 25.0       | 100   | 90-110        |
|                    | Barium    | 6020A  | 604716          | 25.4   | 25.0       | 102   | 90-110        |
|                    | Beryllium | 6020A  | 604716          | 25.8   | 25.0       | 103   | 90-110        |
|                    | Cadmium   | 6020A  | 604716          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Chromium  | 6020A  | 604716          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Cobalt    | 6020A  | 604716          | 25.4   | 25.0       | 101   | 90-110        |
|                    | Copper    | 6020A  | 604716          | 24.5   | 25.0       | 98    | 90-110        |
|                    | Lead      | 6020A  | 604716          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Manganese | 6020A  | 604716          | 24.4   | 25.0       | 98    | 90-110        |
|                    | Nickel    | 6020A  | 604716          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Silver    | 6020A  | 604716          | 12.4   | 12.5       | 100   | 90-110        |
|                    | Thallium  | 6020A  | 604716          | 24.5   | 25.0       | 98    | 90-110        |
|                    | Uranium   | 6020A  | 604716          | 25.5   | 25.0       | 102   | 90-110        |
|                    | Vanadium  | 6020A  | 604716          | 25.7   | 25.0       | 103   | 90-110        |
|                    | Zinc      | 6020A  | 604716          | 25.4   | 25.0       | 102   | 90-110        |
| CCV 08/30/18 13:57 | Antimony  | 6020A  | 604716          | 12.8   | 12.5       | 103   | 90-110        |
|                    | Arsenic   | 6020A  | 604716          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Barium    | 6020A  | 604716          | 25.4   | 25.0       | 102   | 90-110        |
|                    | Beryllium | 6020A  | 604716          | 26.1 ✓ | 25.0       | 104 ✓ | 90-110        |
|                    | Cadmium   | 6020A  | 604716          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Chromium  | 6020A  | 604716          | 25.6   | 25.0       | 102   | 90-110        |
|                    | Cobalt    | 6020A  | 604716          | 25.3   | 25.0       | 101   | 90-110        |
|                    | Copper    | 6020A  | 604716          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Lead      | 6020A  | 604716          | 24.9   | 25.0       | 100   | 90-110        |
|                    | Manganese | 6020A  | 604716          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Nickel    | 6020A  | 604716          | 25.1   | 25.0       | 101   | 90-110        |

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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec. Limits |
|--------------------|-----------|--------|-----------------|--------|------------|-------|---------------|
| CCV 08/30/18 13:57 | Silver    | 6020A  | 604716          | 12.3   | 12.5       | 99    | 90-110        |
|                    | Thallium  | 6020A  | 604716          | 24.6 ✓ | 25.0       | 99 ✓  | 90-110        |
|                    | Uranium   | 6020A  | 604716          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Vanadium  | 6020A  | 604716          | 25.4   | 25.0       | 101   | 90-110        |
|                    | Zinc      | 6020A  | 604716          | 25.0   | 25.0       | 100   | 90-110        |
| CCV 08/30/18 15:49 | Antimony  | 6020A  | 604716          | 12.7   | 12.5       | 102   | 90-110        |
|                    | Arsenic   | 6020A  | 604716          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Barium    | 6020A  | 604716          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Beryllium | 6020A  | 604716          | 25.9   | 25.0       | 104   | 90-110        |
|                    | Cadmium   | 6020A  | 604716          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Chromium  | 6020A  | 604716          | 25.1 ✓ | 25.0       | 100 ✓ | 90-110        |
|                    | Cobalt    | 6020A  | 604716          | 25.1   | 25.0       | 101   | 90-110        |
|                    | Copper    | 6020A  | 604716          | 25.3   | 25.0       | 101   | 90-110        |
|                    | Lead      | 6020A  | 604716          | 25.3   | 25.0       | 101   | 90-110        |
|                    | Manganese | 6020A  | 604716          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Nickel    | 6020A  | 604716          | 25.3   | 25.0       | 101   | 90-110        |
|                    | Silver    | 6020A  | 604716          | 12.2   | 12.5       | 98    | 90-110        |
|                    | Thallium  | 6020A  | 604716          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Uranium   | 6020A  | 604716          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Vanadium  | 6020A  | 604716          | 25.3 ✓ | 25.0       | 101 ✓ | 90-110        |
|                    | Zinc      | 6020A  | 604716          | 25.6   | 25.0       | 103   | 90-110        |
| CCV 08/30/18 16:46 | Antimony  | 6020A  | 604716          | 12.6   | 12.5       | 101   | 90-110        |
|                    | Arsenic   | 6020A  | 604716          | 25.1   | 25.0       | 100   | 90-110        |
|                    | Barium    | 6020A  | 604716          | 25.8 ✓ | 25.0       | 103 ✓ | 90-110        |
|                    | Beryllium | 6020A  | 604716          | 26.3   | 25.0       | 105   | 90-110        |
|                    | Cadmium   | 6020A  | 604716          | 25.3   | 25.0       | 101   | 90-110        |
|                    | Chromium  | 6020A  | 604716          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Cobalt    | 6020A  | 604716          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Copper    | 6020A  | 604716          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Lead      | 6020A  | 604716          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Manganese | 6020A  | 604716          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Nickel    | 6020A  | 604716          | 24.9   | 25.0       | 100   | 90-110        |
|                    | Silver    | 6020A  | 604716          | 12.4   | 12.5       | 99    | 90-110        |
|                    | Thallium  | 6020A  | 604716          | 24.6   | 25.0       | 98    | 90-110        |

ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID           | Analyte   | Method | Analysis Batch: | Result  | True Value | % Rec | % Rec. Limits |
|---------------------|-----------|--------|-----------------|---------|------------|-------|---------------|
| CCV 08/30/18 16:46  | Uranium   | 6020A  | 604716          | 24.9 ✓  | 25.0       | 100 ✓ | 90-110        |
|                     | Vanadium  | 6020A  | 604716          | 25.6    | 25.0       | 102   | 90-110        |
|                     | Zinc      | 6020A  | 604716          | 25.0    | 25.0       | 100   | 90-110        |
| CCV 08/30/18 17:42  | Antimony  | 6020A  | 604716          | 12.6    | 12.5       | 101   | 90-110        |
|                     | Arsenic   | 6020A  | 604716          | 24.6    | 25.0       | 98    | 90-110        |
|                     | Barium    | 6020A  | 604716          | 25.7    | 25.0       | 103   | 90-110        |
|                     | Beryllium | 6020A  | 604716          | 26.4    | 25.0       | 106   | 90-110        |
|                     | Cadmium   | 6020A  | 604716          | 24.9 ✓  | 25.0       | 100 ✓ | 90-110        |
|                     | Chromium  | 6020A  | 604716          | 25.1    | 25.0       | 101   | 90-110        |
|                     | Cobalt    | 6020A  | 604716          | 25.5    | 25.0       | 102   | 90-110        |
|                     | Copper    | 6020A  | 604716          | 25.0    | 25.0       | 100   | 90-110        |
|                     | Lead      | 6020A  | 604716          | 25.1    | 25.0       | 100   | 90-110        |
|                     | Manganese | 6020A  | 604716          | 25.0    | 25.0       | 100   | 90-110        |
|                     | Nickel    | 6020A  | 604716          | 25.0    | 25.0       | 100   | 90-110        |
|                     | Silver    | 6020A  | 604716          | 12.4    | 12.5       | 100   | 90-110        |
|                     | Thallium  | 6020A  | 604716          | 24.4 ✓  | 25.0       | 98 ✓  | 90-110        |
|                     | Uranium   | 6020A  | 604716          | 25.0    | 25.0       | 100   | 90-110        |
|                     | Vanadium  | 6020A  | 604716          | 25.4    | 25.0       | 102   | 90-110        |
|                     | Zinc      | 6020A  | 604716          | 25.1    | 25.0       | 101   | 90-110        |
| ICVB 09/06/18 12:31 | Aluminum  | 6010C  | 605558          | 979     | 1000       | 98    | 90-110        |
|                     | Calcium   | 6010C  | 605558          | 4950 ✓  | 5000       | 99 ✓  | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 4950    | 5000       | 99    | 90-110        |
|                     | Sulfur    | 6010C  | 605558          | 5020    | 5000       | 100   | 90-110        |
| ICV 09/06/18 12:34  | Aluminum  | 6010C  | 605558          | 5050    | 5000       | 101   | 90-110        |
|                     | Calcium   | 6010C  | 605558          | 12500   | 12500      | 100   | 90-110        |
|                     | Iron      | 6010C  | 605558          | 2470    | 2500       | 99    | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 12200   | 12500      | 98    | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 12500   | 12500      | 100   | 90-110        |
|                     | Potassium | 6010C  | 605558          | 12500 ✓ | 12500      | 100 ✓ | 90-110        |
|                     | Sodium    | 6010C  | 605558          | 12400   | 12500      | 99    | 90-110        |
| CCVB 09/06/18 12:52 | Aluminum  | 6010C  | 605558          | 10300   | 10000      | 103   | 90-110        |
|                     | Calcium   | 6010C  | 605558          | 10300   | 10000      | 103   | 90-110        |

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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID           | Analyte   | Method | Analysis Batch: | Result  | True Value | % Rec | % Rec. Limits |
|---------------------|-----------|--------|-----------------|---------|------------|-------|---------------|
| CCVB 09/06/18 12:52 | Iron      | 6010C  | 605558          | 10200   | 10000      | 102   | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 10100   | 10000      | 101   | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 10200 ✓ | 10000      | 102 ✓ | 90-110        |
|                     | Potassium | 6010C  | 605558          | 10200   | 10000      | 102   | 90-110        |
|                     | Sodium    | 6010C  | 605558          | 10000   | 10000      | 100   | 90-110        |
|                     | Sulfur    | 6010C  | 605558          | 992     | 1000       | 99    | 90-110        |
| CCVA 09/06/18 12:55 | Aluminum  | 6010C  | 605558          | 254 ✓   | 250        | 102 ✓ | 90-110        |
|                     | Calcium   | 6010C  | 605558          | 509     | 500        | 102   | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 258     | 250        | 103   | 90-110        |
| CCVB 09/06/18 13:57 | Aluminum  | 6010C  | 605558          | 10300   | 10000      | 103   | 90-110        |
|                     | Calcium   | 6010C  | 605558          | 10300   | 10000      | 103   | 90-110        |
|                     | Iron      | 6010C  | 605558          | 10300 ✓ | 10000      | 103 ✓ | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 10100   | 10000      | 101   | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 10300   | 10000      | 103   | 90-110        |
|                     | Potassium | 6010C  | 605558          | 10400   | 10000      | 104   | 90-110        |
|                     | Sodium    | 6010C  | 605558          | 10100   | 10000      | 101   | 90-110        |
|                     | Sulfur    | 6010C  | 605558          | 980     | 1000       | 98    | 90-110        |
| CCVA 09/06/18 14:00 | Aluminum  | 6010C  | 605558          | 262     | 250        | 105   | 90-110        |
|                     | Calcium   | 6010C  | 605558          | 503 ✓   | 500        | 101 ✓ | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 253     | 250        | 101   | 90-110        |
| CCVB 09/06/18 14:29 | Aluminum  | 6010C  | 605558          | 10300   | 10000      | 103   | 90-110        |
|                     | Calcium   | 6010C  | 605558          | 10400   | 10000      | 104   | 90-110        |
|                     | Iron      | 6010C  | 605558          | 10300   | 10000      | 103   | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 10200   | 10000      | 102   | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 10200   | 10000      | 102   | 90-110        |
|                     | Potassium | 6010C  | 605558          | 10200   | 10000      | 102   | 90-110        |
|                     | Sodium    | 6010C  | 605558          | 9970    | 10000      | 100   | 90-110        |
|                     | Sulfur    | 6010C  | 605558          | 960 ✓   | 1000       | 96 ✓  | 90-110        |
| CCVA 09/06/18 14:32 | Aluminum  | 6010C  | 605558          | 262 ✓   | 250        | 105 ✓ | 90-110        |
|                     | Calcium   | 6010C  | 605558          | 511     | 500        | 102   | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 256     | 250        | 103   | 90-110        |

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QA/QC Report

Client: Teck American Incorporated

Service Request: K1807597

Project: Liquid/2018 Northern Pike Tissue Study/Blanks

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID           | Analyte   | Method | Analysis Batch: | Result  | True Value | % Rec | % Rec. Limits |
|---------------------|-----------|--------|-----------------|---------|------------|-------|---------------|
| CCVB 09/06/18 15:42 | Aluminum  | 6010C  | 605558          | 10400   | 10000      | 104   | 90-110        |
|                     | Calcium   | 6010C  | 605558          | 10500   | 10000      | 105   | 90-110        |
|                     | Iron      | 6010C  | 605558          | 10400   | 10000      | 104   | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 10300   | 10000      | 103   | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 10100 ✓ | 10000      | 101 ✓ | 90-110        |
|                     | Potassium | 6010C  | 605558          | 10100   | 10000      | 101   | 90-110        |
|                     | Sodium    | 6010C  | 605558          | 9890    | 10000      | 99    | 90-110        |
|                     | Sulfur    | 6010C  | 605558          | 960     | 1000       | 96    | 90-110        |
| CCVA 09/06/18 15:45 | Aluminum  | 6010C  | 605558          | 266     | 250        | 106   | 90-110        |
|                     | Calcium   | 6010C  | 605558          | 521     | 500        | 104   | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 260 ✓   | 250        | 104 ✓ | 90-110        |
| CCVB 09/06/18 16:16 | Aluminum  | 6010C  | 605558          | 10300   | 10000      | 103   | 90-110        |
|                     | Calcium   | 6010C  | 605558          | 10400 ✓ | 10000      | 104 ✓ | 90-110        |
|                     | Iron      | 6010C  | 605558          | 10300   | 10000      | 103   | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 10200   | 10000      | 102   | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 10100   | 10000      | 101   | 90-110        |
|                     | Potassium | 6010C  | 605558          | 10200   | 10000      | 102   | 90-110        |
|                     | Sodium    | 6010C  | 605558          | 9980    | 10000      | 100   | 90-110        |
|                     | Sulfur    | 6010C  | 605558          | 960 ✓   | 1000       | 96 ✓  | 90-110        |
| CCVA 09/06/18 16:19 | Aluminum  | 6010C  | 605558          | 266 ✓   | 250        | 107 ✓ | 90-110        |
|                     | Calcium   | 6010C  | 605558          | 517     | 500        | 103   | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 257     | 250        | 103   | 90-110        |
| CCVB 09/06/18 16:32 | Aluminum  | 6010C  | 605558          | 10400   | 10000      | 104   | 90-110        |
|                     | Calcium   | 6010C  | 605558          | 10500   | 10000      | 105   | 90-110        |
|                     | Iron      | 6010C  | 605558          | 10400 ✓ | 10000      | 104 ✓ | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 10300   | 10000      | 103   | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 10100   | 10000      | 101   | 90-110        |
|                     | Potassium | 6010C  | 605558          | 10200   | 10000      | 102   | 90-110        |
|                     | Sodium    | 6010C  | 605558          | 9930    | 10000      | 99    | 90-110        |
|                     | Sulfur    | 6010C  | 605558          | 960     | 1000       | 96    | 90-110        |
| CCVA 09/06/18 16:34 | Aluminum  | 6010C  | 605558          | 266     | 250        | 106   | 90-110        |

ALS Group USA, Corp.

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QA/QC Report

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Service Request: K1807597

Project: Liquid/2018 Northern Pike Tissue Study/Blanks

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID           | Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec. Limits |
|---------------------|-----------|--------|-----------------|--------|------------|-------|---------------|
| CCVA 09/06/18 16:34 | Calcium   | 6010C  | 605558          | 513 ✓  | 500        | 103 ✓ | 90-110        |
|                     | Magnesium | 6010C  | 605558          | 256    | 250        | 102   | 90-110        |
| ICV 09/07/18 15:39  | Antimony  | 6020A  | 605777          | 12.8   | 12.5       | 102   | 90-110        |
|                     | Arsenic   | 6020A  | 605777          | 25.1   | 25.0       | 101   | 90-110        |
|                     | Barium    | 6020A  | 605777          | 101    | 100        | 101   | 90-110        |
|                     | Beryllium | 6020A  | 605777          | 2.65 ✓ | 2.50       | 106 ✓ | 90-110        |
|                     | Cadmium   | 6020A  | 605777          | 12.7   | 12.5       | 102   | 90-110        |
|                     | Chromium  | 6020A  | 605777          | 10.2   | 10.0       | 102   | 90-110        |
|                     | Cobalt    | 6020A  | 605777          | 25.5   | 25.0       | 102   | 90-110        |
|                     | Copper    | 6020A  | 605777          | 12.8   | 12.5       | 102   | 90-110        |
|                     | Lead      | 6020A  | 605777          | 25.4   | 25.0       | 102   | 90-110        |
|                     | Manganese | 6020A  | 605777          | 25.4   | 25.0       | 101   | 90-110        |
|                     | Nickel    | 6020A  | 605777          | 25.0   | 25.0       | 100   | 90-110        |
|                     | Silver    | 6020A  | 605777          | 12.8   | 12.5       | 102   | 90-110        |
|                     | Thallium  | 6020A  | 605777          | 25.3 ✓ | 25.0       | 101 ✓ | 90-110        |
|                     | Uranium   | 6020A  | 605777          | 25.6   | 25.0       | 103   | 90-110        |
|                     | Vanadium  | 6020A  | 605777          | 25.4   | 25.0       | 102   | 90-110        |
|                     | Zinc      | 6020A  | 605777          | 23.9   | 25.0       | 96    | 90-110        |
| CCV 09/07/18 15:43  | Antimony  | 6020A  | 605777          | 12.4   | 12.5       | 99    | 90-110        |
|                     | Arsenic   | 6020A  | 605777          | 24.6   | 25.0       | 98    | 90-110        |
|                     | Barium    | 6020A  | 605777          | 25.2   | 25.0       | 101   | 90-110        |
|                     | Beryllium | 6020A  | 605777          | 24.9   | 25.0       | 100   | 90-110        |
|                     | Cadmium   | 6020A  | 605777          | 24.7   | 25.0       | 99    | 90-110        |
|                     | Chromium  | 6020A  | 605777          | 24.9 ✓ | 25.0       | 100 ✓ | 90-110        |
|                     | Cobalt    | 6020A  | 605777          | 24.9   | 25.0       | 100   | 90-110        |
|                     | Copper    | 6020A  | 605777          | 25.0   | 25.0       | 100   | 90-110        |
|                     | Lead      | 6020A  | 605777          | 24.8   | 25.0       | 99    | 90-110        |
|                     | Manganese | 6020A  | 605777          | 24.4 ✓ | 25.0       | 98 ✓  | 90-110        |
|                     | Nickel    | 6020A  | 605777          | 24.4   | 25.0       | 98    | 90-110        |
|                     | Silver    | 6020A  | 605777          | 12.5   | 12.5       | 100   | 90-110        |
|                     | Thallium  | 6020A  | 605777          | 25.1   | 25.0       | 100   | 90-110        |
|                     | Uranium   | 6020A  | 605777          | 24.6   | 25.0       | 98    | 90-110        |
|                     | Vanadium  | 6020A  | 605777          | 25.0   | 25.0       | 100   | 90-110        |
|                     | Zinc      | 6020A  | 605777          | 24.9   | 25.0       | 100   | 90-110        |

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QA/QC Report

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Service Request: K1807597

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec. Limits |
|--------------------|-----------|--------|-----------------|--------|------------|-------|---------------|
| CCV 09/07/18 16:55 | Antimony  | 6020A  | 605777          | 12.3   | 12.5       | 99    | 90-110        |
|                    | Arsenic   | 6020A  | 605777          | 24.7 ✓ | 25.0       | 99 ✓  | 90-110        |
|                    | Barium    | 6020A  | 605777          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Beryllium | 6020A  | 605777          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Cadmium   | 6020A  | 605777          | 24.3   | 25.0       | 97    | 90-110        |
|                    | Chromium  | 6020A  | 605777          | 25.1   | 25.0       | 101   | 90-110        |
|                    | Cobalt    | 6020A  | 605777          | 25.5   | 25.0       | 102   | 90-110        |
|                    | Copper    | 6020A  | 605777          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Lead      | 6020A  | 605777          | 25.1   | 25.0       | 100   | 90-110        |
|                    | Manganese | 6020A  | 605777          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Nickel    | 6020A  | 605777          | 25.1   | 25.0       | 100   | 90-110        |
|                    | Silver    | 6020A  | 605777          | 12.5 ✓ | 12.5       | 100 ✓ | 90-110        |
|                    | Thallium  | 6020A  | 605777          | 25.4   | 25.0       | 102   | 90-110        |
|                    | Uranium   | 6020A  | 605777          | 24.6   | 25.0       | 99    | 90-110        |
|                    | Vanadium  | 6020A  | 605777          | 25.3   | 25.0       | 101   | 90-110        |
|                    | Zinc      | 6020A  | 605777          | 24.8   | 25.0       | 99    | 90-110        |
| CCV 09/07/18 17:45 | Antimony  | 6020A  | 605777          | 12.2   | 12.5       | 98    | 90-110        |
|                    | Arsenic   | 6020A  | 605777          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Barium    | 6020A  | 605777          | 24.4   | 25.0       | 98    | 90-110        |
|                    | Beryllium | 6020A  | 605777          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Cadmium   | 6020A  | 605777          | 24.4 ✓ | 25.0       | 98 ✓  | 90-110        |
|                    | Chromium  | 6020A  | 605777          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Cobalt    | 6020A  | 605777          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Copper    | 6020A  | 605777          | 24.9   | 25.0       | 100   | 90-110        |
|                    | Lead      | 6020A  | 605777          | 25.3   | 25.0       | 101   | 90-110        |
|                    | Manganese | 6020A  | 605777          | 24.2   | 25.0       | 97    | 90-110        |
|                    | Nickel    | 6020A  | 605777          | 25.1   | 25.0       | 100   | 90-110        |
|                    | Silver    | 6020A  | 605777          | 12.3   | 12.5       | 98    | 90-110        |
|                    | Thallium  | 6020A  | 605777          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Uranium   | 6020A  | 605777          | 24.8 ✓ | 25.0       | 99 ✓  | 90-110        |
|                    | Vanadium  | 6020A  | 605777          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Zinc      | 6020A  | 605777          | 25.0   | 25.0       | 100   | 90-110        |
| ICV 10/03/18 09:09 | Antimony  | 6020A  | 609313          | 12.3   | 12.5       | 98    | 90-110        |
|                    | Arsenic   | 6020A  | 609313          | 24.1   | 25.0       | 96    | 90-110        |

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec. Limits |
|--------------------|-----------|--------|-----------------|--------|------------|-------|---------------|
| ICV 10/03/18 09:09 | Barium    | 6020A  | 609313          | 99.3   | 100        | 99    | 90-110        |
|                    | Beryllium | 6020A  | 609313          | 2.51   | 2.50       | 100   | 90-110        |
|                    | Cadmium   | 6020A  | 609313          | 12.5 ✓ | 12.5       | 100 ✓ | 90-110        |
|                    | Chromium  | 6020A  | 609313          | 9.60   | 10.0       | 96    | 90-110        |
|                    | Cobalt    | 6020A  | 609313          | 24.2   | 25.0       | 97    | 90-110        |
|                    | Copper    | 6020A  | 609313          | 12.3   | 12.5       | 98    | 90-110        |
|                    | Lead      | 6020A  | 609313          | 24.9   | 25.0       | 100   | 90-110        |
|                    | Manganese | 6020A  | 609313          | 22.7   | 25.0       | 91    | 90-110        |
|                    | Nickel    | 6020A  | 609313          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Silver    | 6020A  | 609313          | 12.9 ✓ | 12.5       | 103 ✓ | 90-110        |
|                    | Thallium  | 6020A  | 609313          | 24.3   | 25.0       | 97    | 90-110        |
|                    | Uranium   | 6020A  | 609313          | 24.5   | 25.0       | 98    | 90-110        |
|                    | Vanadium  | 6020A  | 609313          | 23.3   | 25.0       | 93    | 90-110        |
|                    | Zinc      | 6020A  | 609313          | 23.7   | 25.0       | 95    | 90-110        |
| CCV 10/03/18 09:12 | Antimony  | 6020A  | 609313          | 12.4   | 12.5       | 99    | 90-110        |
|                    | Arsenic   | 6020A  | 609313          | 25.1 ✓ | 25.0       | 101 ✓ | 90-110        |
|                    | Barium    | 6020A  | 609313          | 25.4   | 25.0       | 102   | 90-110        |
|                    | Beryllium | 6020A  | 609313          | 25.5   | 25.0       | 102   | 90-110        |
|                    | Cadmium   | 6020A  | 609313          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Chromium  | 6020A  | 609313          | 23.9   | 25.0       | 96    | 90-110        |
|                    | Cobalt    | 6020A  | 609313          | 24.3   | 25.0       | 97    | 90-110        |
|                    | Copper    | 6020A  | 609313          | 24.5   | 25.0       | 98    | 90-110        |
|                    | Lead      | 6020A  | 609313          | 24.7 ✓ | 25.0       | 99 ✓  | 90-110        |
|                    | Manganese | 6020A  | 609313          | 24.3   | 25.0       | 97    | 90-110        |
|                    | Nickel    | 6020A  | 609313          | 24.3   | 25.0       | 97    | 90-110        |
|                    | Silver    | 6020A  | 609313          | 12.4   | 12.5       | 99    | 90-110        |
|                    | Thallium  | 6020A  | 609313          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Uranium   | 6020A  | 609313          | 24.6   | 25.0       | 98    | 90-110        |
|                    | Vanadium  | 6020A  | 609313          | 24.4   | 25.0       | 98    | 90-110        |
|                    | Zinc      | 6020A  | 609313          | 23.4   | 25.0       | 94    | 90-110        |
| CCV 10/03/18 09:59 | Antimony  | 6020A  | 609313          | 12.6   | 12.5       | 101   | 90-110        |
|                    | Arsenic   | 6020A  | 609313          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Barium    | 6020A  | 609313          | 24.9   | 25.0       | 100   | 90-110        |
|                    | Beryllium | 6020A  | 609313          | 24.9   | 25.0       | 100   | 90-110        |



ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec. Limits |
|--------------------|-----------|--------|-----------------|--------|------------|-------|---------------|
| CCV 10/03/18 09:59 |           |        |                 |        |            |       |               |
|                    | Cadmium   | 6020A  | 609313          | 25.1   | 25.0       | 100   | 90-110        |
|                    | Chromium  | 6020A  | 609313          | 24.7 ✓ | 25.0       | 99 ✓  | 90-110        |
|                    | Cobalt    | 6020A  | 609313          | 25.1   | 25.0       | 101   | 90-110        |
|                    | Copper    | 6020A  | 609313          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Lead      | 6020A  | 609313          | 24.6   | 25.0       | 98    | 90-110        |
|                    | Manganese | 6020A  | 609313          | 25.3   | 25.0       | 101   | 90-110        |
|                    | Nickel    | 6020A  | 609313          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Silver    | 6020A  | 609313          | 12.4   | 12.5       | 99    | 90-110        |
|                    | Thallium  | 6020A  | 609313          | 24.6   | 25.0       | 99    | 90-110        |
|                    | Uranium   | 6020A  | 609313          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Vanadium  | 6020A  | 609313          | 24.5 ✓ | 25.0       | 98 ✓  | 90-110        |
|                    | Zinc      | 6020A  | 609313          | 24.8   | 25.0       | 99    | 90-110        |
| CCV 10/03/18 10:29 |           |        |                 |        |            |       |               |
|                    | Antimony  | 6020A  | 609313          | 12.4   | 12.5       | 100   | 90-110        |
|                    | Arsenic   | 6020A  | 609313          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Barium    | 6020A  | 609313          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Beryllium | 6020A  | 609313          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Cadmium   | 6020A  | 609313          | 25.1   | 25.0       | 101   | 90-110        |
|                    | Chromium  | 6020A  | 609313          | 24.1   | 25.0       | 96    | 90-110        |
|                    | Cobalt    | 6020A  | 609313          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Copper    | 6020A  | 609313          | 24.3   | 25.0       | 97    | 90-110        |
|                    | Lead      | 6020A  | 609313          | 25.1   | 25.0       | 100   | 90-110        |
|                    | Manganese | 6020A  | 609313          | 25.3   | 25.0       | 101   | 90-110        |
|                    | Nickel    | 6020A  | 609313          | 24.5   | 25.0       | 98    | 90-110        |
|                    | Silver    | 6020A  | 609313          | 12.3   | 12.5       | 98    | 90-110        |
|                    | Thallium  | 6020A  | 609313          | 25.1   | 25.0       | 100   | 90-110        |
|                    | Uranium   | 6020A  | 609313          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Vanadium  | 6020A  | 609313          | 24.1   | 25.0       | 97    | 90-110        |
|                    | Zinc      | 6020A  | 609313          | 23.8   | 25.0       | 95    | 90-110        |
| CCV 10/03/18 10:57 |           |        |                 |        |            |       |               |
|                    | Antimony  | 6020A  | 609313          | 12.3   | 12.5       | 98    | 90-110        |
|                    | Arsenic   | 6020A  | 609313          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Barium    | 6020A  | 609313          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Beryllium | 6020A  | 609313          | 25.6   | 25.0       | 103   | 90-110        |
|                    | Cadmium   | 6020A  | 609313          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Chromium  | 6020A  | 609313          | 24.0   | 25.0       | 96    | 90-110        |

no assoc.  
samples  
↓

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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec. Limits |
|--------------------|-----------|--------|-----------------|--------|------------|-------|---------------|
| CCV 10/03/18 10:57 | Cobalt    | 6020A  | 609313          | 24.3   | 25.0       | 97    | 90-110        |
|                    | Copper    | 6020A  | 609313          | 23.7   | 25.0       | 95    | 90-110        |
|                    | Lead      | 6020A  | 609313          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Manganese | 6020A  | 609313          | 24.5   | 25.0       | 98    | 90-110        |
|                    | Nickel    | 6020A  | 609313          | 24.2   | 25.0       | 97    | 90-110        |
|                    | Silver    | 6020A  | 609313          | 12.4   | 12.5       | 99    | 90-110        |
|                    | Thallium  | 6020A  | 609313          | 24.9   | 25.0       | 100   | 90-110        |
|                    | Uranium   | 6020A  | 609313          | 24.5   | 25.0       | 98    | 90-110        |
|                    | Vanadium  | 6020A  | 609313          | 24.0   | 25.0       | 96    | 90-110        |
|                    | Zinc      | 6020A  | 609313          | 24.8   | 25.0       | 99    | 90-110        |
| CCV 10/03/18 11:21 | Antimony  | 6020A  | 609313          | 12.2   | 12.5       | 98    | 90-110        |
|                    | Arsenic   | 6020A  | 609313          | 25.3   | 25.0       | 101   | 90-110        |
|                    | Barium    | 6020A  | 609313          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Beryllium | 6020A  | 609313          | 25.4   | 25.0       | 102   | 90-110        |
|                    | Cadmium   | 6020A  | 609313          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Chromium  | 6020A  | 609313          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Cobalt    | 6020A  | 609313          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Copper    | 6020A  | 609313          | 24.4   | 25.0       | 98    | 90-110        |
|                    | Lead      | 6020A  | 609313          | 24.9   | 25.0       | 100   | 90-110        |
|                    | Manganese | 6020A  | 609313          | 24.3   | 25.0       | 97    | 90-110        |
|                    | Nickel    | 6020A  | 609313          | 24.4   | 25.0       | 98    | 90-110        |
|                    | Silver    | 6020A  | 609313          | 12.1   | 12.5       | 97    | 90-110        |
|                    | Thallium  | 6020A  | 609313          | 24.9   | 25.0       | 100   | 90-110        |
|                    | Uranium   | 6020A  | 609313          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Vanadium  | 6020A  | 609313          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Zinc      | 6020A  | 609313          | 24.5   | 25.0       | 98    | 90-110        |
| CCV 10/03/18 11:55 | Antimony  | 6020A  | 609313          | 12.4   | 12.5       | 99    | 90-110        |
|                    | Arsenic   | 6020A  | 609313          | 24.4   | 25.0       | 97    | 90-110        |
|                    | Barium    | 6020A  | 609313          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Beryllium | 6020A  | 609313          | 25.3   | 25.0       | 101   | 90-110        |
|                    | Cadmium   | 6020A  | 609313          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Chromium  | 6020A  | 609313          | 24.2   | 25.0       | 97    | 90-110        |
|                    | Cobalt    | 6020A  | 609313          | 23.9   | 25.0       | 96    | 90-110        |
|                    | Copper    | 6020A  | 609313          | 24.1   | 25.0       | 96    | 90-110        |

ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec. Limits |
|--------------------|-----------|--------|-----------------|--------|------------|-------|---------------|
| CCV 10/03/18 11:55 | Lead      | 6020A  | 609313          | 24.4   | 25.0       | 97    | 90-110        |
|                    | Manganese | 6020A  | 609313          | 24.6   | 25.0       | 99    | 90-110        |
|                    | Nickel    | 6020A  | 609313          | 23.9   | 25.0       | 96    | 90-110        |
|                    | Silver    | 6020A  | 609313          | 12.2   | 12.5       | 98    | 90-110        |
|                    | Thallium  | 6020A  | 609313          | 24.2   | 25.0       | 97    | 90-110        |
|                    | Uranium   | 6020A  | 609313          | 24.6   | 25.0       | 98    | 90-110        |
|                    | Vanadium  | 6020A  | 609313          | 23.9   | 25.0       | 96    | 90-110        |
|                    | Zinc      | 6020A  | 609313          | 24.1   | 25.0       | 96    | 90-110        |
| CCV 10/03/18 12:27 | Antimony  | 6020A  | 609313          | 12.5   | 12.5       | 100   | 90-110        |
|                    | Arsenic   | 6020A  | 609313          | 25.1   | 25.0       | 101   | 90-110        |
|                    | Barium    | 6020A  | 609313          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Beryllium | 6020A  | 609313          | 25.0   | 25.0       | 100   | 90-110        |
|                    | Cadmium   | 6020A  | 609313          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Chromium  | 6020A  | 609313          | 24.9   | 25.0       | 99    | 90-110        |
|                    | Cobalt    | 6020A  | 609313          | 24.6   | 25.0       | 98    | 90-110        |
|                    | Copper    | 6020A  | 609313          | 24.1   | 25.0       | 97    | 90-110        |
|                    | Lead      | 6020A  | 609313          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Manganese | 6020A  | 609313          | 25.1   | 25.0       | 100   | 90-110        |
|                    | Nickel    | 6020A  | 609313          | 24.4   | 25.0       | 98    | 90-110        |
|                    | Silver    | 6020A  | 609313          | 12.2   | 12.5       | 98    | 90-110        |
|                    | Thallium  | 6020A  | 609313          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Uranium   | 6020A  | 609313          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Vanadium  | 6020A  | 609313          | 24.9   | 25.0       | 100   | 90-110        |
|                    | Zinc      | 6020A  | 609313          | 24.6   | 25.0       | 99    | 90-110        |
| CCV 10/03/18 12:35 | Antimony  | 6020A  | 609313          | 12.4   | 12.5       | 99    | 90-110        |
|                    | Arsenic   | 6020A  | 609313          | 25.2   | 25.0       | 101   | 90-110        |
|                    | Barium    | 6020A  | 609313          | 25.5   | 25.0       | 102   | 90-110        |
|                    | Beryllium | 6020A  | 609313          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Cadmium   | 6020A  | 609313          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Chromium  | 6020A  | 609313          | 24.8   | 25.0       | 99    | 90-110        |
|                    | Cobalt    | 6020A  | 609313          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Copper    | 6020A  | 609313          | 24.9   | 25.0       | 100   | 90-110        |
|                    | Lead      | 6020A  | 609313          | 24.7   | 25.0       | 99    | 90-110        |
|                    | Manganese | 6020A  | 609313          | 25.5   | 25.0       | 102   | 90-110        |

ALS Group USA, Corp.

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QA/QC Report

Client: Teck American Incorporated

Service Request: K1807597

Project: Liquid/2018 Northern Pike Tissue Study/Blanks

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID           | Analyte   | Method | Analysis Batch: | Result  | True Value | % Rec | % Rec. Limits |
|---------------------|-----------|--------|-----------------|---------|------------|-------|---------------|
| CCV 10/03/18 12:35  | Nickel    | 6020A  | 609313          | 24.5    | 25.0       | 98    | 90-110        |
|                     | Silver    | 6020A  | 609313          | 12.2    | 12.5       | 98    | 90-110        |
|                     | Thallium  | 6020A  | 609313          | 24.8    | 25.0       | 99    | 90-110        |
|                     | Uranium   | 6020A  | 609313          | 24.1    | 25.0       | 96    | 90-110        |
|                     | Vanadium  | 6020A  | 609313          | 24.7    | 25.0       | 99    | 90-110        |
|                     | Zinc      | 6020A  | 609313          | 25.1    | 25.0       | 100   | 90-110        |
| CCV 10/03/18 12:54  | Uranium   | 6020A  | 609313          | 23.6    | 25.0       | 95    | 90-110        |
| ICVB 10/03/18 11:13 | Aluminum  | 6010C  | 609389          | 962 ✓   | 1000       | 96 ✓  | 90-110        |
|                     | Calcium   | 6010C  | 609389          | 4890    | 5000       | 98    | 90-110        |
|                     | Magnesium | 6010C  | 609389          | 4860    | 5000       | 97    | 90-110        |
|                     | Sulfur    | 6010C  | 609389          | 5010    | 5000       | 100   | 90-110        |
| ICV 10/03/18 11:16  | Aluminum  | 6010C  | 609389          | 5260    | 5000       | 105   | 90-110        |
|                     | Calcium   | 6010C  | 609389          | 12500   | 12500      | 100   | 90-110        |
|                     | Iron      | 6010C  | 609389          | 2480 ✓  | 2500       | 99 ✓  | 90-110        |
|                     | Magnesium | 6010C  | 609389          | 12500   | 12500      | 100   | 90-110        |
|                     | Magnesium | 6010C  | 609389          | 12400   | 12500      | 100   | 90-110        |
|                     | Potassium | 6010C  | 609389          | 12300   | 12500      | 99    | 90-110        |
|                     | Sodium    | 6010C  | 609389          | 12400   | 12500      | 99    | 90-110        |
| CCVB 10/03/18 11:36 | Aluminum  | 6010C  | 609389          | 10500   | 10000      | 105   | 90-110        |
|                     | Calcium   | 6010C  | 609389          | 10100 ✓ | 10000      | 101 ✓ | 90-110        |
|                     | Iron      | 6010C  | 609389          | 10100   | 10000      | 101   | 90-110        |
|                     | Magnesium | 6010C  | 609389          | 10200   | 10000      | 102   | 90-110        |
|                     | Magnesium | 6010C  | 609389          | 10100   | 10000      | 101   | 90-110        |
|                     | Potassium | 6010C  | 609389          | 10000   | 10000      | 100   | 90-110        |
|                     | Sodium    | 6010C  | 609389          | 10100   | 10000      | 101   | 90-110        |
|                     | Sulfur    | 6010C  | 609389          | 1010    | 1000       | 101   | 90-110        |
| CCVA 10/03/18 11:39 | Aluminum  | 6010C  | 609389          | 263     | 250        | 105   | 90-110        |
|                     | Calcium   | 6010C  | 609389          | 500     | 500        | 100   | 90-110        |
|                     | Magnesium | 6010C  | 609389          | 253 ✓   | 250        | 101 ✓ | 90-110        |
| CCVB 10/03/18 12:32 | Aluminum  | 6010C  | 609389          | 10500   | 10000      | 105   | 90-110        |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks

**Service Request:** K1807597

**INITIAL AND CONTINUING CALIBRATION VERIFICATION**

Concentration Units: ug/L

| Sample ID | Analyte        | Method | Analysis Batch: | Result  | True Value | ✓<br>% Rec | % Rec.<br>Limits |
|-----------|----------------|--------|-----------------|---------|------------|------------|------------------|
| CCVB      | 10/03/18 12:32 |        |                 |         |            |            |                  |
|           | Calcium        | 6010C  | 609389          | 9940    | 10000      | 99         | 90-110           |
|           | Iron           | 6010C  | 609389          | 9990    | 10000      | 100        | 90-110           |
|           | Magnesium      | 6010C  | 609389          | 9990    | 10000      | 100        | 90-110           |
|           | Magnesium      | 6010C  | 609389          | 10100   | 10000      | 101        | 90-110           |
|           | Potassium      | 6010C  | 609389          | 10200 ✓ | 10000      | 102 ✓      | 90-110           |
|           | Sodium         | 6010C  | 609389          | 10200   | 10000      | 102        | 90-110           |
|           | Sulfur         | 6010C  | 609389          | 1020    | 1000       | 102        | 90-110           |
| CCVA      | 10/03/18 12:35 |        |                 |         |            |            |                  |
|           | Aluminum       | 6010C  | 609389          | 272 ✓   | 250        | 109 ✓      | 90-110           |
|           | Calcium        | 6010C  | 609389          | 501     | 500        | 100        | 90-110           |
|           | Magnesium      | 6010C  | 609389          | 251     | 250        | 100        | 90-110           |
| ICV       | 10/03/18 11:24 |        |                 |         |            |            |                  |
|           | Selenium       | 7742   | 609410          | 4.16 ✓  | 4.00       | 104 ✓      | 90-120           |
| CCV       | 10/03/18 11:30 |        |                 |         |            |            |                  |
|           | Selenium       | 7742   | 609410          | 4.14 ✓  | 4.00       | 104 ✓      | 90-110           |
| CCV       | 10/03/18 11:58 |        |                 |         |            |            |                  |
|           | Selenium       | 7742   | 609410          | 4.05 ✓  | 4.00       | 101 ✓      | 90-110           |

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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

LOW LEVEL INITIAL AND LOW LEVEL CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID | Analyte   | Method | Analysis Batch: | Result  | True Value | % Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|-----------|--------|-----------------|---------|------------|-------|------------------|----------------|
| LLICV     | Selenium  | 7742   | 604386          | 0.49 ✓  | 0.5        | 98 ✓  | 70-130 ✓         | 08/28/18 11:11 |
| LLICV     | Antimony  | 6020A  | 604716          | 0.060   | 0.05       | 120   | 70-130           | 08/30/18 11:54 |
|           | Arsenic   | 6020A  | 604716          | 0.54    | 0.5        | 107   | 70-130           | 08/30/18 11:54 |
|           | Barium    | 6020A  | 604716          | 0.050   | 0.05       | 100   | 70-130           | 08/30/18 11:54 |
|           | Beryllium | 6020A  | 604716          | 0.020 ✓ | 0.02       | 99 ✓  | 70-130           | 08/30/18 11:54 |
|           | Cadmium   | 6020A  | 604716          | 0.020   | 0.02       | 102   | 70-130           | 08/30/18 11:54 |
|           | Chromium  | 6020A  | 604716          | 0.20    | 0.2        | 100   | 70-130           | 08/30/18 11:54 |
|           | Cobalt    | 6020A  | 604716          | 0.020   | 0.02       | 99    | 70-130           | 08/30/18 11:54 |
|           | Copper    | 6020A  | 604716          | 0.097   | 0.1        | 97    | 70-130           | 08/30/18 11:54 |
|           | Lead      | 6020A  | 604716          | 0.020   | 0.02       | 99    | 70-130           | 08/30/18 11:54 |
|           | Manganese | 6020A  | 604716          | 0.21    | 0.2        | 104   | 70-130           | 08/30/18 11:54 |
|           | Nickel    | 6020A  | 604716          | 0.19    | 0.2        | 95    | 70-130           | 08/30/18 11:54 |
|           | Silver    | 6020A  | 604716          | 0.019   | 0.02       | 96    | 70-130           | 08/30/18 11:54 |
|           | Thallium  | 6020A  | 604716          | 0.021   | 0.02       | 103   | 70-130           | 08/30/18 11:54 |
|           | Uranium   | 6020A  | 604716          | 0.016 ✓ | 0.02       | 81 ✓  | 70-130           | 08/30/18 11:54 |
|           | Vanadium  | 6020A  | 604716          | 0.18    | 0.2        | 89    | 70-130           | 08/30/18 11:54 |
|           | Zinc      | 6020A  | 604716          | 1.9     | 2.0        | 96    | 70-130           | 08/30/18 11:54 |
| LLCCV     | Arsenic   | 6020A  | 604716          | 0.50    | 0.5        | 99    | 70-130           | 08/30/18 14:45 |
|           | Barium    | 6020A  | 604716          | 0.058   | 0.05       | 117   | 70-130           | 08/30/18 14:45 |
|           | Beryllium | 6020A  | 604716          | 0.022   | 0.02       | 111   | 70-130           | 08/30/18 14:45 |
|           | Cadmium   | 6020A  | 604716          | 0.025   | 0.02       | 127   | 70-130           | 08/30/18 14:45 |
|           | Chromium  | 6020A  | 604716          | 0.20    | 0.2        | 101   | 70-130           | 08/30/18 14:45 |
|           | Cobalt    | 6020A  | 604716          | 0.019 ✓ | 0.02       | 96 ✓  | 70-130           | 08/30/18 14:45 |
|           | Copper    | 6020A  | 604716          | 0.10    | 0.1        | 104   | 70-130           | 08/30/18 14:45 |
|           | Lead      | 6020A  | 604716          | 0.019   | 0.02       | 96    | 70-130           | 08/30/18 14:45 |
|           | Manganese | 6020A  | 604716          | 0.19    | 0.2        | 94    | 70-130           | 08/30/18 14:45 |
|           | Nickel    | 6020A  | 604716          | 0.17    | 0.2        | 86    | 70-130           | 08/30/18 14:45 |
|           | Silver    | 6020A  | 604716          | 0.017   | 0.02       | 87    | 70-130           | 08/30/18 14:45 |
|           | Thallium  | 6020A  | 604716          | 0.024   | 0.02       | 119   | 70-130           | 08/30/18 14:45 |
|           | Uranium   | 6020A  | 604716          | 0.020   | 0.02       | 101   | 70-130           | 08/30/18 14:45 |
|           | Vanadium  | 6020A  | 604716          | 0.21 ✓  | 0.2        | 106 ✓ | 70-130           | 08/30/18 14:45 |
|           | Zinc      | 6020A  | 604716          | 2.0     | 2.0        | 98    | 70-130           | 08/30/18 14:45 |
| LLCCV     | Antimony  | 6020A  | 604716          | 0.047 ✓ | 0.05       | 94 ✓  | 70-130           | 08/30/18 15:01 |

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QA/QC Report

Client: Teck American Incorporated  
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Service Request: K1807597

LOW LEVEL INITIAL AND LOW LEVEL CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID | Analyte   | Method | Analysis Batch: | Result  | True Value | % Rec | % Rec. Limits | Analysis Date  |
|-----------|-----------|--------|-----------------|---------|------------|-------|---------------|----------------|
| LLCCV     |           |        |                 |         |            |       |               |                |
|           | Arsenic   | 6020A  | 604716          | 0.49    | 0.5        | 98    | 70-130        | 08/30/18 17:50 |
|           | Barium    | 6020A  | 604716          | 0.061   | 0.05       | 123   | 70-130        | 08/30/18 17:50 |
|           | Beryllium | 6020A  | 604716          | 0.024 ✓ | 0.02       | 120 ✓ | 70-130        | 08/30/18 17:50 |
|           | Cadmium   | 6020A  | 604716          | 0.014   | 0.02       | 72    | 70-130        | 08/30/18 17:50 |
|           | Chromium  | 6020A  | 604716          | 0.19    | 0.2        | 93    | 70-130        | 08/30/18 17:50 |
|           | Cobalt    | 6020A  | 604716          | 0.019   | 0.02       | 95    | 70-130        | 08/30/18 17:50 |
|           | Copper    | 6020A  | 604716          | 0.093   | 0.1        | 93    | 70-130        | 08/30/18 17:50 |
|           | Lead      | 6020A  | 604716          | 0.021   | 0.02       | 106   | 70-130        | 08/30/18 17:50 |
|           | Manganese | 6020A  | 604716          | 0.18    | 0.2        | 88    | 70-130        | 08/30/18 17:50 |
|           | Nickel    | 6020A  | 604716          | 0.16    | 0.2        | 79    | 70-130        | 08/30/18 17:50 |
|           | Silver    | 6020A  | 604716          | 0.019   | 0.02       | 95    | 70-130        | 08/30/18 17:50 |
|           | Thallium  | 6020A  | 604716          | 0.023 ✓ | 0.02       | 117 ✓ | 70-130        | 08/30/18 17:50 |
|           | Uranium   | 6020A  | 604716          | 0.018   | 0.02       | 91    | 70-130        | 08/30/18 17:50 |
|           | Vanadium  | 6020A  | 604716          | 0.20    | 0.2        | 100   | 70-130        | 08/30/18 17:50 |
|           | Zinc      | 6020A  | 604716          | 2.0     | 2.0        | 98    | 70-130        | 08/30/18 17:50 |
| LLCCV     |           |        |                 |         |            |       |               |                |
|           | Antimony  | 6020A  | 604716          | 0.048 ✓ | 0.05       | 96 ✓  | 70-130        | 08/30/18 17:55 |
| LLICV     |           |        |                 |         |            |       |               |                |
|           | Aluminum  | 6010C  | 605558          | 11.1    | 10.0       | 111   | 70-130        | 09/06/18 12:44 |
|           | Calcium   | 6010C  | 605558          | 21.3    | 20.0       | 107   | 70-130        | 09/06/18 12:44 |
|           | Iron      | 6010C  | 605558          | 25.3 ✓  | 20.0       | 127 ✓ | 70-130        | 09/06/18 12:44 |
|           | Magnesium | 6010C  | 605558          | 5.2     | 5.0        | 104   | 70-130        | 09/06/18 12:44 |
|           | Potassium | 6010C  | 605558          | 190     | 200        | 95    | 70-130        | 09/06/18 12:44 |
|           | Sodium    | 6010C  | 605558          | 190     | 200        | 95    | 70-130        | 09/06/18 12:44 |
| LLICV     |           |        |                 |         |            |       |               |                |
|           | Sulfur    | 6010C  | 605558          | 64.6 ✓  | 80.0       | 81 ✓  | 70-130        | 09/06/18 12:47 |
| LLCCV     |           |        |                 |         |            |       |               |                |
|           | Aluminum  | 6010C  | 605558          | 11.2    | 10.0       | 112   | 70-130        | 09/06/18 14:42 |
|           | Calcium   | 6010C  | 605558          | 21.7 ✓  | 20.0       | 109 ✓ | 70-130        | 09/06/18 14:42 |
|           | Iron      | 6010C  | 605558          | 24.7    | 20.0       | 124   | 70-130        | 09/06/18 14:42 |
|           | Magnesium | 6010C  | 605558          | 5.1     | 5.0        | 102   | 70-130        | 09/06/18 14:42 |
|           | Potassium | 6010C  | 605558          | 237     | 200        | 119   | 70-130        | 09/06/18 14:42 |
|           | Sodium    | 6010C  | 605558          | 205     | 200        | 103   | 70-130        | 09/06/18 14:42 |
| LLCCV     |           |        |                 |         |            |       |               |                |
|           | Sulfur    | 6010C  | 605558          | 132 ✓   | 160        | 83 ✓  | 70-130        | 09/06/18 15:02 |

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QA/QC Report

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Service Request: K1807597

LOW LEVEL INITIAL AND LOW LEVEL CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID | Analyte   | Method | Analysis Batch: | Result | True Value | ✓<br>% Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|-----------|--------|-----------------|--------|------------|------------|------------------|----------------|
| LLCCV     |           |        |                 |        |            |            |                  |                |
|           | Aluminum  | 6010C  | 605558          | 11.5   | 10.0       | 115        | 70-130           | 09/06/18 16:39 |
|           | Calcium   | 6010C  | 605558          | 21.9   | 20.0       | 110        | 70-130           | 09/06/18 16:39 |
|           | Iron      | 6010C  | 605558          | 20.3   | 20.0       | 102        | 70-130           | 09/06/18 16:39 |
|           | Magnesium | 6010C  | 605558          | 5.2 ✓  | 5.0        | 104 ✓      | 70-130           | 09/06/18 16:39 |
|           | Potassium | 6010C  | 605558          | 161    | 200        | 81         | 70-130           | 09/06/18 16:39 |
|           | Sodium    | 6010C  | 605558          | 202    | 200        | 101        | 70-130           | 09/06/18 16:39 |
| LLCCV     |           |        |                 |        |            |            |                  |                |
|           | Sulfur    | 6010C  | 605558          | 140 ✓  | 160        | 88 ✓       | 70-130           | 09/06/18 16:45 |
| LLICV     |           |        |                 |        |            |            |                  |                |
|           | Antimony  | 6020A  | 605777          | 0.064  | 0.05       | 129        | 70-130           | 09/07/18 16:00 |
|           | Arsenic   | 6020A  | 605777          | 0.53 ✓ | 0.5        | 106 ✓      | 70-130           | 09/07/18 16:00 |
|           | Barium    | 6020A  | 605777          | 0.058  | 0.05       | 115        | 70-130           | 09/07/18 16:00 |
|           | Beryllium | 6020A  | 605777          | 0.021  | 0.02       | 103        | 70-130           | 09/07/18 16:00 |
|           | Cadmium   | 6020A  | 605777          | 0.023  | 0.02       | 114        | 70-130           | 09/07/18 16:00 |
|           | Chromium  | 6020A  | 605777          | 0.19   | 0.2        | 97         | 70-130           | 09/07/18 16:00 |
|           | Cobalt    | 6020A  | 605777          | 0.016  | 0.02       | 79         | 70-130           | 09/07/18 16:00 |
|           | Copper    | 6020A  | 605777          | 0.096  | 0.1        | 96         | 70-130           | 09/07/18 16:00 |
|           | Lead      | 6020A  | 605777          | 0.020  | 0.02       | 102        | 70-130           | 09/07/18 16:00 |
|           | Manganese | 6020A  | 605777          | 0.20   | 0.2        | 102        | 70-130           | 09/07/18 16:00 |
|           | Nickel    | 6020A  | 605777          | 0.22 ✓ | 0.2        | 109 ✓      | 70-130           | 09/07/18 16:00 |
|           | Silver    | 6020A  | 605777          | 0.019  | 0.02       | 94         | 70-130           | 09/07/18 16:00 |
|           | Thallium  | 6020A  | 605777          | 0.022  | 0.02       | 111        | 70-130           | 09/07/18 16:00 |
|           | Uranium   | 6020A  | 605777          | 0.019  | 0.02       | 95         | 70-130           | 09/07/18 16:00 |
|           | Vanadium  | 6020A  | 605777          | 0.19   | 0.2        | 94         | 70-130           | 09/07/18 16:00 |
|           | Zinc      | 6020A  | 605777          | 1.9    | 2.0        | 93         | 70-130           | 09/07/18 16:00 |
| LLCCV     |           |        |                 |        |            |            |                  |                |
|           | Antimony  | 6020A  | 605777          | 0.057  | 0.05       | 113        | 70-130           | 09/07/18 17:59 |
|           | Arsenic   | 6020A  | 605777          | 0.49   | 0.5        | 99         | 70-130           | 09/07/18 17:59 |
|           | Barium    | 6020A  | 605777          | 0.042  | 0.05       | 84         | 70-130           | 09/07/18 17:59 |
|           | Beryllium | 6020A  | 605777          | 0.022  | 0.02       | 112        | 70-130           | 09/07/18 17:59 |
|           | Cadmium   | 6020A  | 605777          | 0.022  | 0.02       | 112        | 70-130           | 09/07/18 17:59 |
|           | Chromium  | 6020A  | 605777          | 0.20 ✓ | 0.2        | 100 ✓      | 70-130           | 09/07/18 17:59 |
|           | Cobalt    | 6020A  | 605777          | 0.017  | 0.02       | 85         | 70-130           | 09/07/18 17:59 |
|           | Copper    | 6020A  | 605777          | 0.075  | 0.1        | 75         | 70-130           | 09/07/18 17:59 |
|           | Lead      | 6020A  | 605777          | 0.019  | 0.02       | 97         | 70-130           | 09/07/18 17:59 |
|           | Manganese | 6020A  | 605777          | 0.20   | 0.2        | 102        | 70-130           | 09/07/18 17:59 |



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QA/QC Report

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LOW LEVEL INITIAL AND LOW LEVEL CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID | Analyte   | Method | Analysis Batch: | Result  | True Value | ✓<br>% Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|-----------|--------|-----------------|---------|------------|------------|------------------|----------------|
| LLCCV     |           |        |                 |         |            |            |                  |                |
|           | Nickel    | 6020A  | 605777          | 0.21    | 0.2        | 106        | 70-130           | 09/07/18 17:59 |
|           | Silver    | 6020A  | 605777          | 0.018   | 0.02       | 89         | 70-130           | 09/07/18 17:59 |
|           | Thallium  | 6020A  | 605777          | 0.023   | 0.02       | 113        | 70-130           | 09/07/18 17:59 |
|           | Uranium   | 6020A  | 605777          | 0.018   | 0.02       | 91         | 70-130           | 09/07/18 17:59 |
|           | Vanadium  | 6020A  | 605777          | 0.18    | 0.2        | 90         | 70-130           | 09/07/18 17:59 |
|           | Zinc      | 6020A  | 605777          | 1.9 ✓   | 2.0        | 96 ✓       | 70-130           | 09/07/18 17:59 |
| LLICV     |           |        |                 |         |            |            |                  |                |
|           | Antimony  | 6020A  | 609313          | 0.042   | 0.05       | 83         | 70-130           | 10/03/18 09:26 |
|           | Arsenic   | 6020A  | 609313          | 0.46    | 0.5        | 92         | 70-130           | 10/03/18 09:26 |
|           | Barium    | 6020A  | 609313          | 0.053   | 0.05       | 105        | 70-130           | 10/03/18 09:26 |
|           | Beryllium | 6020A  | 609313          | 0.022   | 0.02       | 110        | 70-130           | 10/03/18 09:26 |
|           | Cadmium   | 6020A  | 609313          | 0.020   | 0.02       | 101        | 70-130           | 10/03/18 09:26 |
|           | Chromium  | 6020A  | 609313          | 0.18 ✓  | 0.2        | 91 ✓       | 70-130           | 10/03/18 09:26 |
|           | Cobalt    | 6020A  | 609313          | 0.015   | 0.02       | 77         | 70-130           | 10/03/18 09:26 |
|           | Copper    | 6020A  | 609313          | 0.11    | 0.1        | 110        | 70-130           | 10/03/18 09:26 |
|           | Lead      | 6020A  | 609313          | 0.021   | 0.02       | 106        | 70-130           | 10/03/18 09:26 |
|           | Manganese | 6020A  | 609313          | 0.17    | 0.2        | 87         | 70-130           | 10/03/18 09:26 |
|           | Nickel    | 6020A  | 609313          | 0.20    | 0.2        | 101        | 70-130           | 10/03/18 09:26 |
|           | Silver    | 6020A  | 609313          | 0.018   | 0.02       | 90         | 70-130           | 10/03/18 09:26 |
|           | Thallium  | 6020A  | 609313          | 0.019   | 0.02       | 97         | 70-130           | 10/03/18 09:26 |
|           | Uranium   | 6020A  | 609313          | 0.016 ✓ | 0.02       | 80 ✓       | 70-130           | 10/03/18 09:26 |
|           | Vanadium  | 6020A  | 609313          | 0.19    | 0.2        | 96         | 70-130           | 10/03/18 09:26 |
|           | Zinc      | 6020A  | 609313          | 2.0     | 2.0        | 101        | 70-130           | 10/03/18 09:26 |
| LLCCV     |           |        |                 |         |            |            |                  |                |
|           | Antimony  | 6020A  | 609313          | 0.054   | 0.05       | 108        | 70-130           | 10/03/18 11:28 |
|           | Arsenic   | 6020A  | 609313          | 0.49    | 0.5        | 99         | 70-130           | 10/03/18 11:28 |
|           | Barium    | 6020A  | 609313          | 0.048   | 0.05       | 96         | 70-130           | 10/03/18 11:28 |
|           | Beryllium | 6020A  | 609313          | 0.020   | 0.02       | 101        | 70-130           | 10/03/18 11:28 |
|           | Cadmium   | 6020A  | 609313          | 0.017 ✓ | 0.02       | 85 ✓       | 70-130           | 10/03/18 11:28 |
|           | Chromium  | 6020A  | 609313          | 0.21    | 0.2        | 104        | 70-130           | 10/03/18 11:28 |
|           | Cobalt    | 6020A  | 609313          | 0.014   | 0.02       | 70         | 70-130           | 10/03/18 11:28 |
|           | Copper    | 6020A  | 609313          | 0.11    | 0.1        | 113        | 70-130           | 10/03/18 11:28 |
|           | Lead      | 6020A  | 609313          | 0.021   | 0.02       | 105        | 70-130           | 10/03/18 11:28 |
|           | Manganese | 6020A  | 609313          | 0.18    | 0.2        | 92         | 70-130           | 10/03/18 11:28 |
|           | Nickel    | 6020A  | 609313          | 0.19    | 0.2        | 94         | 70-130           | 10/03/18 11:28 |
|           | Silver    | 6020A  | 609313          | 0.018 ✓ | 0.02       | 90 ✓       | 70-130           | 10/03/18 11:28 |

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QA/QC Report

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LOW LEVEL INITIAL AND LOW LEVEL CONTINUING CALIBRATION VERIFICATION

Concentration Units: ug/L

| Sample ID | Analyte   | Method | Analysis Batch: | Result  | True Value | ✓<br>% Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|-----------|--------|-----------------|---------|------------|------------|------------------|----------------|
| LLCCV     | Thallium  | 6020A  | 609313          | 0.022   | 0.02       | 111        | 70-130           | 10/03/18 11:28 |
|           | Uranium   | 6020A  | 609313          | 0.018   | 0.02       | 90         | 70-130           | 10/03/18 11:28 |
|           | Vanadium  | 6020A  | 609313          | 0.19    | 0.2        | 93         | 70-130           | 10/03/18 11:28 |
|           | Zinc      | 6020A  | 609313          | 2.0     | 2.0        | 101        | 70-130           | 10/03/18 11:28 |
| LLCCV     | Uranium   | 6020A  | 609313          | 0.019 ✓ | 0.02       | 93 ✓       | 70-130           | 10/03/18 13:00 |
| LLICV     | Selenium  | 7742   | 609410          | 0.53 ✓  | 0.5        | 106 ✓      | 70-130           | 10/03/18 11:28 |
| LLICV     | Aluminum  | 6010C  | 609389          | 9.9     | 10.0       | 99         | 70-130           | 10/03/18 11:30 |
|           | Calcium   | 6010C  | 609389          | 20.3 ✓  | 20.0       | 102 ✓      | 70-130           | 10/03/18 11:30 |
|           | Iron      | 6010C  | 609389          | 16.8    | 20.0       | 84         | 70-130           | 10/03/18 11:30 |
|           | Magnesium | 6010C  | 609389          | 4.3     | 5.0        | 86         | 70-130           | 10/03/18 11:30 |
|           | Potassium | 6010C  | 609389          | 171     | 200        | 85         | 70-130           | 10/03/18 11:30 |
|           | Sodium    | 6010C  | 609389          | 212     | 200        | 106        | 70-130           | 10/03/18 11:30 |
|           | Sulfur    | 6010C  | 609389          | 39.5    | 40.0       | 99         | 70-130           | 10/03/18 11:30 |
| LLCCV     | Aluminum  | 6010C  | 609389          | 10.7    | 10.0       | 107        | 70-130           | 10/03/18 12:44 |
|           | Calcium   | 6010C  | 609389          | 21.2    | 20.0       | 106        | 70-130           | 10/03/18 12:44 |
|           | Magnesium | 6010C  | 609389          | 4.4     | 5.0        | 88         | 70-130           | 10/03/18 12:44 |
|           | Potassium | 6010C  | 609389          | 227 ✓   | 200        | 113 ✓      | 70-130           | 10/03/18 12:44 |
|           | Sodium    | 6010C  | 609389          | 218     | 200        | 109        | 70-130           | 10/03/18 12:44 |
|           | Sulfur    | 6010C  | 609389          | 42.9    | 40.0       | 107        | 70-130           | 10/03/18 12:44 |
| LLCCV     | Iron      | 6010C  | 609389          | 32.8 ✓  | 40.0       | 82 ✓       | 70-130           | 10/03/18 12:47 |

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QA/QC Report

Client: Teck American Incorporated

Service Request: K1807597

Project: Liquid/2018 Northern Pike Tissue Study/Blanks

INITIAL AND CONTINUING CALIBRATION BLANKS

All associated samples are RB/EB  
so no blank qualification was applied.  
Negative bias was evaluated.

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result  | C |
|--------------------|-----------|--------|-----------------|---------|---|
| ICB 08/28/18 11:09 | Selenium  | 7742   | 604386          | 0.50    | U |
| CCB 08/28/18 11:16 | Selenium  | 7742   | 604386          | 0.50    | U |
| CCB 08/28/18 11:44 | Selenium  | 7742   | 604386          | 0.50    | U |
| CCB 08/28/18 12:12 | Selenium  | 7742   | 604386          | 0.50    | U |
| CCB 08/28/18 12:39 | Selenium  | 7742   | 604386          | 0.50    | U |
| ICB 08/30/18 11:41 | Antimony  | 6020A  | 604716          | 0.020   | U |
|                    | Arsenic   | 6020A  | 604716          | 0.08    | U |
|                    | Barium    | 6020A  | 604716          | 0.020   | U |
|                    | Beryllium | 6020A  | 604716          | 0.004 ✓ | J |
|                    | Cadmium   | 6020A  | 604716          | 0.009 ✓ | J |
|                    | Chromium  | 6020A  | 604716          | 0.03    | U |
|                    | Cobalt    | 6020A  | 604716          | 0.009 ✓ | J |
|                    | Copper    | 6020A  | 604716          | 0.02    | U |
|                    | Lead      | 6020A  | 604716          | 0.007   | U |
|                    | Manganese | 6020A  | 604716          | 0.006   | U |
|                    | Nickel    | 6020A  | 604716          | 0.04    | U |
|                    | Silver    | 6020A  | 604716          | 0.003 ✓ | J |
|                    | Thallium  | 6020A  | 604716          | 0.010 ✓ | J |
|                    | Uranium   | 6020A  | 604716          | 0.007 ✓ | J |
|                    | Vanadium  | 6020A  | 604716          | 0.04    | U |
|                    | Zinc      | 6020A  | 604716          | 0.08    | U |
| CCB 08/30/18 11:45 | Antimony  | 6020A  | 604716          | 0.020   | U |
|                    | Arsenic   | 6020A  | 604716          | 0.08    | U |
|                    | Barium    | 6020A  | 604716          | 0.020   | U |
|                    | Beryllium | 6020A  | 604716          | 0.002 ✓ | J |
|                    | Cadmium   | 6020A  | 604716          | 0.009   | U |
|                    | Chromium  | 6020A  | 604716          | 0.03    | U |
|                    | Cobalt    | 6020A  | 604716          | 0.005   | U |
|                    | Copper    | 6020A  | 604716          | 0.02    | U |
|                    | Lead      | 6020A  | 604716          | 0.007   | U |

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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result    | C |
|--------------------|-----------|--------|-----------------|-----------|---|
| CCB 08/30/18 11:45 | Manganese | 6020A  | 604716          | 0.006     | U |
|                    | Nickel    | 6020A  | 604716          | 0.04      | U |
|                    | Silver    | 6020A  | 604716          | 0.002     | U |
|                    | Thallium  | 6020A  | 604716          | 0.008     | U |
|                    | Uranium   | 6020A  | 604716          | 0.005     | U |
|                    | Vanadium  | 6020A  | 604716          | 0.04      | U |
|                    | Zinc      | 6020A  | 604716          | 0.08      | U |
| CCB 08/30/18 13:07 | Antimony  | 6020A  | 604716          | 0.020     | U |
|                    | Arsenic   | 6020A  | 604716          | 0.08      | U |
|                    | Barium    | 6020A  | 604716          | 0.020     | U |
|                    | Beryllium | 6020A  | 604716          | 0.003 —   | J |
|                    | Cadmium   | 6020A  | 604716          | 0.009     | U |
|                    | Chromium  | 6020A  | 604716          | 0.03      | U |
|                    | Cobalt    | 6020A  | 604716          | 0.005     | U |
|                    | Copper    | 6020A  | 604716          | 0.02      | U |
|                    | Lead      | 6020A  | 604716          | 0.007     | U |
|                    | Manganese | 6020A  | 604716          | 0.02 —    | J |
|                    | Nickel    | 6020A  | 604716          | -0.0449 — | J |
|                    | Silver    | 6020A  | 604716          | 0.002     | U |
|                    | Thallium  | 6020A  | 604716          | 0.008     | U |
|                    | Uranium   | 6020A  | 604716          | 0.005     | U |
|                    | Vanadium  | 6020A  | 604716          | 0.04      | U |
|                    | Zinc      | 6020A  | 604716          | 0.08      | U |
| CCB 08/30/18 14:01 | Antimony  | 6020A  | 604716          | 0.020     | U |
|                    | Arsenic   | 6020A  | 604716          | 0.08      | U |
|                    | Barium    | 6020A  | 604716          | 0.020     | U |
|                    | Beryllium | 6020A  | 604716          | 0.003 —   | J |
|                    | Cadmium   | 6020A  | 604716          | 0.009     | U |
|                    | Chromium  | 6020A  | 604716          | 0.03      | U |
|                    | Cobalt    | 6020A  | 604716          | 0.005     | U |
|                    | Copper    | 6020A  | 604716          | 0.02      | U |
|                    | Lead      | 6020A  | 604716          | 0.007     | U |
|                    | Manganese | 6020A  | 604716          | -0.0104 — | J |
|                    | Nickel    | 6020A  | 604716          | -0.0463 — | J |

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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result         | C |
|--------------------|-----------|--------|-----------------|----------------|---|
| CCB 08/30/18 14:01 |           |        |                 |                |   |
|                    | Silver    | 6020A  | 604716          | 0.003 ✓        | J |
|                    | Thallium  | 6020A  | 604716          | 0.012 ✓        | J |
|                    | Uranium   | 6020A  | 604716          | 0.007 ✓        | J |
|                    | Vanadium  | 6020A  | 604716          | 0.04           | U |
|                    | Zinc      | 6020A  | 604716          | 0.08           | U |
| CCB 08/30/18 15:53 |           |        |                 |                |   |
|                    | Antimony  | 6020A  | 604716          | 0.020          | U |
|                    | Arsenic   | 6020A  | 604716          | 0.08           | U |
|                    | Barium    | 6020A  | 604716          | 0.020          | U |
|                    | Beryllium | 6020A  | 604716          | 0.005 ✓        | J |
|                    | Cadmium   | 6020A  | 604716          | 0.012 ✓        | J |
|                    | Chromium  | 6020A  | 604716          | 0.03           | U |
|                    | Cobalt    | 6020A  | 604716          | 0.005          | U |
|                    | Copper    | 6020A  | 604716          | 0.02           | U |
|                    | Lead      | 6020A  | 604716          | 0.009 ✓        | J |
|                    | Manganese | 6020A  | 604716          | 0.009 ✓        | J |
|                    | Nickel    | 6020A  | 604716          | ✓ 2x -0.0482 ✓ | J |
|                    | Silver    | 6020A  | 604716          | 0.004 ✓        | J |
|                    | Thallium  | 6020A  | 604716          | 0.012 ✓        | J |
|                    | Uranium   | 6020A  | 604716          | 0.007 ✓        | J |
|                    | Vanadium  | 6020A  | 604716          | 0.04           | U |
|                    | Zinc      | 6020A  | 604716          | 0.08           | U |
| CCB 08/30/18 16:50 |           |        |                 |                |   |
|                    | Antimony  | 6020A  | 604716          | 0.020          | U |
|                    | Arsenic   | 6020A  | 604716          | 0.08           | U |
|                    | Barium    | 6020A  | 604716          | 0.020          | U |
|                    | Beryllium | 6020A  | 604716          | 0.002          | U |
|                    | Cadmium   | 6020A  | 604716          | 0.009          | U |
|                    | Chromium  | 6020A  | 604716          | 0.03           | U |
|                    | Cobalt    | 6020A  | 604716          | 0.005          | U |
|                    | Copper    | 6020A  | 604716          | 0.02           | U |
|                    | Lead      | 6020A  | 604716          | 0.007          | U |
|                    | Manganese | 6020A  | 604716          | ✓ 2x -0.0224 ✓ | J |
|                    | Nickel    | 6020A  | 604716          | -0.0480 ✓      | J |
|                    | Silver    | 6020A  | 604716          | 0.002          | U |
|                    | Thallium  | 6020A  | 604716          | 0.008          | U |

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QA/QC Report

Client: Teck American Incorporated  
 Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

## INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

## Sample ID

| Analyte            | Method | Analysis Batch: | Result    | C |
|--------------------|--------|-----------------|-----------|---|
| CCB 08/30/18 16:50 |        |                 |           |   |
| Uranium            | 6020A  | 604716          | 0.005     | U |
| Vanadium           | 6020A  | 604716          | 0.04      | U |
| Zinc               | 6020A  | 604716          | 0.08      | U |
| CCB 08/30/18 17:46 |        |                 |           |   |
| Antimony           | 6020A  | 604716          | 0.020     | U |
| Arsenic            | 6020A  | 604716          | 0.08      | U |
| Barium             | 6020A  | 604716          | 0.020     | U |
| Beryllium          | 6020A  | 604716          | 0.003 ✓   | J |
| Cadmium            | 6020A  | 604716          | 0.009     | U |
| Chromium           | 6020A  | 604716          | 0.03      | U |
| Cobalt             | 6020A  | 604716          | 0.005     | U |
| Copper             | 6020A  | 604716          | 0.02      | U |
| Lead               | 6020A  | 604716          | 0.007     | U |
| Manganese          | 6020A  | 604716          | -0.0239 ✓ | J |
| Nickel             | 6020A  | 604716          | -0.0494 ✓ | J |
| Silver             | 6020A  | 604716          | 0.004 ✓   | J |
| Thallium           | 6020A  | 604716          | 0.011 ✓   | J |
| Uranium            | 6020A  | 604716          | 0.007 ✓   | J |
| Vanadium           | 6020A  | 604716          | 0.04      | U |
| Zinc               | 6020A  | 604716          | 0.08      | U |
| ICB 09/06/18 12:36 |        |                 |           |   |
| Aluminum           | 6010C  | 605558          | 4         | U |
| Calcium            | 6010C  | 605558          | 2 ✓       | J |
| Iron               | 6010C  | 605558          | 6 ✓       | J |
| Magnesium          | 6010C  | 605558          | 0.3 ✓     | J |
| Potassium          | 6010C  | 605558          | 60        | U |
| Sodium             | 6010C  | 605558          | 20        | U |
| Sulfur             | 6010C  | 605558          | -7.10 ✓   | J |
| CCB 09/06/18 12:57 |        |                 |           |   |
| Aluminum           | 6010C  | 605558          | 4         | U |
| Calcium            | 6010C  | 605558          | 0.9       | U |
| Iron               | 6010C  | 605558          | 9 ✓       | J |
| Magnesium          | 6010C  | 605558          | 0.3       | U |
| Potassium          | 6010C  | 605558          | 60        | U |
| Sodium             | 6010C  | 605558          | 20        | U |
| Sulfur             | 6010C  | 605558          | -26.0 ✓   | J |

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QA/QC Report

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Service Request: K1807597

Project: Liquid/2018 Northern Pike Tissue Study/Blanks

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

Sample ID

| Analyte            | Method | Analysis Batch: | Result | C |
|--------------------|--------|-----------------|--------|---|
| CCB 09/06/18 14:02 |        |                 |        |   |
| Aluminum           | 6010C  | 605558          | 4      | U |
| Calcium            | 6010C  | 605558          | 0.9    | U |
| Iron               | 6010C  | 605558          | 3      | U |
| Magnesium          | 6010C  | 605558          | 0.3    | U |
| Potassium          | 6010C  | 605558          | 70 ✓   | J |
| Sodium             | 6010C  | 605558          | 20     | U |
| Sulfur             | 6010C  | 605558          | -37.5  | J |
| CCB 09/06/18 14:34 |        |                 |        |   |
| Aluminum           | 6010C  | 605558          | 4      | U |
| Calcium            | 6010C  | 605558          | 0.9    | U |
| Iron               | 6010C  | 605558          | 6 ✓    | J |
| Magnesium          | 6010C  | 605558          | 0.3    | U |
| Potassium          | 6010C  | 605558          | 60     | U |
| Sodium             | 6010C  | 605558          | 20     | U |
| Sulfur             | 6010C  | 605558          | -38.8  | J |
| CCB 09/06/18 15:48 |        |                 |        |   |
| Aluminum           | 6010C  | 605558          | 4      | U |
| Calcium            | 6010C  | 605558          | 0.9    | U |
| Iron               | 6010C  | 605558          | 6 ✓    | J |
| Magnesium          | 6010C  | 605558          | 0.3    | U |
| Potassium          | 6010C  | 605558          | 60     | U |
| Sodium             | 6010C  | 605558          | 20     | U |
| Sulfur             | 6010C  | 605558          | -42.9  | J |
| CCB 09/06/18 16:21 |        |                 |        |   |
| Aluminum           | 6010C  | 605558          | 4      | U |
| Calcium            | 6010C  | 605558          | 0.9    | U |
| Iron               | 6010C  | 605558          | 3      | U |
| Magnesium          | 6010C  | 605558          | 0.3    | U |
| Potassium          | 6010C  | 605558          | 60     | U |
| Sodium             | 6010C  | 605558          | 20     | U |
| Sulfur             | 6010C  | 605558          | -43.5  | J |
| CCB 09/06/18 16:37 |        |                 |        |   |
| Aluminum           | 6010C  | 605558          | 4      | U |
| Calcium            | 6010C  | 605558          | 0.9    | U |
| Iron               | 6010C  | 605558          | 4 ✓    | J |
| Magnesium          | 6010C  | 605558          | 0.3    | U |

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QA/QC Report

Client: Teck American Incorporated

Service Request: K1807597

Project: Liquid/2018 Northern Pike Tissue Study/Blanks

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

Sample ID

| Analyte            | Method | Analysis Batch: | Result | C |
|--------------------|--------|-----------------|--------|---|
| CCB 09/06/18 16:37 |        |                 |        |   |
| Potassium          | 6010C  | 605558          | 60     | U |
| Sodium             | 6010C  | 605558          | 20     | U |
| Sulfur             | 6010C  | 605558          | -44.9  | J |
| ICB 09/07/18 15:48 |        |                 |        |   |
| Antimony           | 6020A  | 605777          | 0.020  | U |
| Arsenic            | 6020A  | 605777          | 0.08   | U |
| Barium             | 6020A  | 605777          | 0.020  | U |
| Beryllium          | 6020A  | 605777          | 0.004  | J |
| Cadmium            | 6020A  | 605777          | 0.009  | J |
| Chromium           | 6020A  | 605777          | 0.03   | U |
| Cobalt             | 6020A  | 605777          | 0.005  | U |
| Copper             | 6020A  | 605777          | 0.02   | U |
| Lead               | 6020A  | 605777          | 0.007  | J |
| Manganese          | 6020A  | 605777          | 0.006  | U |
| Nickel             | 6020A  | 605777          | 0.04   | U |
| Silver             | 6020A  | 605777          | 0.004  | J |
| Thallium           | 6020A  | 605777          | 0.011  | J |
| Uranium            | 6020A  | 605777          | 0.007  | J |
| Vanadium           | 6020A  | 605777          | 0.04   | U |
| Zinc               | 6020A  | 605777          | 0.08   | U |
| CCB 09/07/18 15:52 |        |                 |        |   |
| Antimony           | 6020A  | 605777          | 0.020  | U |
| Arsenic            | 6020A  | 605777          | 0.08   | U |
| Barium             | 6020A  | 605777          | 0.020  | U |
| Beryllium          | 6020A  | 605777          | 0.002  | U |
| Cadmium            | 6020A  | 605777          | 0.009  | U |
| Chromium           | 6020A  | 605777          | 0.03   | U |
| Cobalt             | 6020A  | 605777          | 0.005  | U |
| Copper             | 6020A  | 605777          | 0.02   | U |
| Lead               | 6020A  | 605777          | 0.007  | U |
| Manganese          | 6020A  | 605777          | 0.006  | U |
| Nickel             | 6020A  | 605777          | 0.04   | U |
| Silver             | 6020A  | 605777          | 0.002  | U |
| Thallium           | 6020A  | 605777          | 0.008  | U |
| Uranium            | 6020A  | 605777          | 0.005  | U |
| Vanadium           | 6020A  | 605777          | 0.04   | U |



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QA/QC Report

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Service Request: K1807597

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

Sample ID

| Analyte            | Method | Analysis Batch: | Result  | C |
|--------------------|--------|-----------------|---------|---|
| CCB 09/07/18 15:52 |        |                 |         |   |
| Zinc               | 6020A  | 605777          | 0.08    | U |
| CCB 09/07/18 16:59 |        |                 |         |   |
| Antimony           | 6020A  | 605777          | 0.020   | U |
| Arsenic            | 6020A  | 605777          | 0.08    | U |
| Barium             | 6020A  | 605777          | 0.020   | U |
| Beryllium          | 6020A  | 605777          | 0.002   | U |
| Cadmium            | 6020A  | 605777          | 0.009   | U |
| Chromium           | 6020A  | 605777          | 0.03    | U |
| Cobalt             | 6020A  | 605777          | 0.005   | U |
| Copper             | 6020A  | 605777          | 0.02    | U |
| Lead               | 6020A  | 605777          | 0.007   | U |
| Manganese          | 6020A  | 605777          | 0.006   | U |
| Nickel             | 6020A  | 605777          | 0.04    | U |
| Silver             | 6020A  | 605777          | 0.002 ✓ | J |
| Thallium           | 6020A  | 605777          | 0.012 ✓ | J |
| Uranium            | 6020A  | 605777          | 0.005 ✓ | J |
| Vanadium           | 6020A  | 605777          | 0.04    | U |
| Zinc               | 6020A  | 605777          | 0.08    | U |
| CCB 09/07/18 17:49 |        |                 |         |   |
| Antimony           | 6020A  | 605777          | 0.020   | U |
| Arsenic            | 6020A  | 605777          | 0.08    | U |
| Barium             | 6020A  | 605777          | 0.020   | U |
| Beryllium          | 6020A  | 605777          | 0.004 ✓ | J |
| Cadmium            | 6020A  | 605777          | 0.010 ✓ | J |
| Chromium           | 6020A  | 605777          | 0.03    | U |
| Cobalt             | 6020A  | 605777          | 0.005   | U |
| Copper             | 6020A  | 605777          | 0.02    | U |
| Lead               | 6020A  | 605777          | 0.008 ✓ | J |
| Manganese          | 6020A  | 605777          | 0.006   | U |
| Nickel             | 6020A  | 605777          | 0.04    | U |
| Silver             | 6020A  | 605777          | 0.004 ✓ | J |
| Thallium           | 6020A  | 605777          | 0.013 ✓ | J |
| Uranium            | 6020A  | 605777          | 0.008 ✓ | J |
| Vanadium           | 6020A  | 605777          | 0.04    | U |
| Zinc               | 6020A  | 605777          | 0.08    | U |

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QA/QC Report

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INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result  | C |
|--------------------|-----------|--------|-----------------|---------|---|
| ICB 10/03/18 09:14 |           |        |                 |         |   |
|                    | Antimony  | 6020A  | 609313          | 0.020   | U |
|                    | Arsenic   | 6020A  | 609313          | 0.09    | U |
|                    | Barium    | 6020A  | 609313          | 0.020   | U |
|                    | Beryllium | 6020A  | 609313          | 0.009 ✓ | J |
|                    | Cadmium   | 6020A  | 609313          | 0.008   | U |
|                    | Chromium  | 6020A  | 609313          | 0.03    | U |
|                    | Cobalt    | 6020A  | 609313          | 0.009   | U |
|                    | Copper    | 6020A  | 609313          | 0.05    | U |
|                    | Lead      | 6020A  | 609313          | 0.006   | U |
|                    | Manganese | 6020A  | 609313          | 0.04    | U |
|                    | Nickel    | 6020A  | 609313          | 0.04    | U |
|                    | Silver    | 6020A  | 609313          | 0.009   | U |
|                    | Thallium  | 6020A  | 609313          | 0.015 ✓ | J |
|                    | Uranium   | 6020A  | 609313          | 0.008   | U |
|                    | Vanadium  | 6020A  | 609313          | 0.04    | U |
|                    | Zinc      | 6020A  | 609313          | 0.5     | U |
| CCB 10/03/18 09:17 |           |        |                 |         |   |
|                    | Antimony  | 6020A  | 609313          | 0.020   | U |
|                    | Arsenic   | 6020A  | 609313          | 0.09    | U |
|                    | Barium    | 6020A  | 609313          | 0.020   | U |
|                    | Beryllium | 6020A  | 609313          | 0.005   | U |
|                    | Cadmium   | 6020A  | 609313          | 0.008   | U |
|                    | Chromium  | 6020A  | 609313          | 0.03    | U |
|                    | Cobalt    | 6020A  | 609313          | 0.009   | U |
|                    | Copper    | 6020A  | 609313          | 0.05    | U |
|                    | Lead      | 6020A  | 609313          | 0.006   | U |
|                    | Manganese | 6020A  | 609313          | 0.04    | U |
|                    | Nickel    | 6020A  | 609313          | 0.04    | U |
|                    | Silver    | 6020A  | 609313          | 0.009   | U |
|                    | Thallium  | 6020A  | 609313          | 0.009   | U |
|                    | Uranium   | 6020A  | 609313          | 0.008   | U |
|                    | Vanadium  | 6020A  | 609313          | 0.04    | U |
|                    | Zinc      | 6020A  | 609313          | 0.5     | U |
| CCB 10/03/18 10:04 |           |        |                 |         |   |
|                    | Antimony  | 6020A  | 609313          | 0.020   | U |
|                    | Arsenic   | 6020A  | 609313          | 0.09    | U |

## ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
 Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

## INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

## Sample ID

| Analyte            | Method | Analysis Batch: | Result  | C |
|--------------------|--------|-----------------|---------|---|
| CCB 10/03/18 10:04 |        |                 |         |   |
| Barium             | 6020A  | 609313          | 0.020   | U |
| Beryllium          | 6020A  | 609313          | 0.005   | U |
| Cadmium            | 6020A  | 609313          | 0.008   | U |
| Chromium           | 6020A  | 609313          | 0.03    | U |
| Cobalt             | 6020A  | 609313          | 0.009   | U |
| Copper             | 6020A  | 609313          | 0.05    | U |
| Lead               | 6020A  | 609313          | 0.006   | U |
| Manganese          | 6020A  | 609313          | 0.04    | U |
| Nickel             | 6020A  | 609313          | 0.04    | U |
| Silver             | 6020A  | 609313          | 0.009   | U |
| Thallium           | 6020A  | 609313          | 0.009 ✓ | J |
| Uranium            | 6020A  | 609313          | 0.008   | U |
| Vanadium           | 6020A  | 609313          | 0.04    | U |
| Zinc               | 6020A  | 609313          | 0.5     | U |
| CCB 10/03/18 10:33 |        |                 |         |   |
| Antimony           | 6020A  | 609313          | 0.020   | U |
| Arsenic            | 6020A  | 609313          | 0.09    | U |
| Barium             | 6020A  | 609313          | 0.020   | U |
| Beryllium          | 6020A  | 609313          | 0.011   | J |
| Cadmium            | 6020A  | 609313          | 0.008   | U |
| Chromium           | 6020A  | 609313          | 0.03    | U |
| Cobalt             | 6020A  | 609313          | 0.009   | U |
| Copper             | 6020A  | 609313          | 0.05    | U |
| Lead               | 6020A  | 609313          | 0.006   | U |
| Manganese          | 6020A  | 609313          | -0.0443 | J |
| Nickel             | 6020A  | 609313          | 0.04    | U |
| Silver             | 6020A  | 609313          | 0.009   | U |
| Thallium           | 6020A  | 609313          | 0.010   | J |
| Uranium            | 6020A  | 609313          | 0.008   | U |
| Vanadium           | 6020A  | 609313          | 0.04    | U |
| Zinc               | 6020A  | 609313          | 0.5     | U |
| CCB 10/03/18 11:01 |        |                 |         |   |
| Antimony           | 6020A  | 609313          | 0.020   | U |
| Arsenic            | 6020A  | 609313          | 0.09    | U |
| Barium             | 6020A  | 609313          | 0.020   | U |
| Beryllium          | 6020A  | 609313          | 0.005   | U |

no assoc  
 samples  
 ↓

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | C |
|--------------------|-----------|--------|-----------------|--------|---|
| CCB 10/03/18 11:01 | Cadmium   | 6020A  | 609313          | 0.008  | U |
|                    | Chromium  | 6020A  | 609313          | 0.03   | U |
|                    | Cobalt    | 6020A  | 609313          | 0.009  | U |
|                    | Copper    | 6020A  | 609313          | 0.05   | U |
|                    | Lead      | 6020A  | 609313          | 0.006  | U |
|                    | Manganese | 6020A  | 609313          | 0.04   | U |
|                    | Nickel    | 6020A  | 609313          | 0.04   | U |
|                    | Silver    | 6020A  | 609313          | 0.009  | U |
|                    | Thallium  | 6020A  | 609313          | 0.009  | U |
|                    | Uranium   | 6020A  | 609313          | 0.008  | U |
|                    | Vanadium  | 6020A  | 609313          | 0.04   | U |
|                    | Zinc      | 6020A  | 609313          | 0.5    | U |
| CCB 10/03/18 11:25 | Antimony  | 6020A  | 609313          | 0.020  | U |
|                    | Arsenic   | 6020A  | 609313          | 0.09   | U |
|                    | Barium    | 6020A  | 609313          | 0.020  | U |
|                    | Beryllium | 6020A  | 609313          | 0.005  | U |
|                    | Cadmium   | 6020A  | 609313          | 0.008  | U |
|                    | Chromium  | 6020A  | 609313          | 0.03   | U |
|                    | Cobalt    | 6020A  | 609313          | 0.009  | U |
|                    | Copper    | 6020A  | 609313          | 0.05   | U |
|                    | Lead      | 6020A  | 609313          | 0.006  | U |
|                    | Manganese | 6020A  | 609313          | 0.04   | U |
|                    | Nickel    | 6020A  | 609313          | 0.04   | U |
|                    | Silver    | 6020A  | 609313          | 0.009  | U |
|                    | Thallium  | 6020A  | 609313          | 0.009  | J |
|                    | Uranium   | 6020A  | 609313          | 0.008  | U |
|                    | Vanadium  | 6020A  | 609313          | 0.04   | U |
|                    | Zinc      | 6020A  | 609313          | 0.5    | U |
| CCB 10/03/18 11:59 | Antimony  | 6020A  | 609313          | 0.020  | U |
|                    | Arsenic   | 6020A  | 609313          | 0.09   | U |
|                    | Barium    | 6020A  | 609313          | 0.020  | U |
|                    | Beryllium | 6020A  | 609313          | 0.005  | U |
|                    | Cadmium   | 6020A  | 609313          | 0.008  | U |
|                    | Chromium  | 6020A  | 609313          | 0.03   | U |

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated

Service Request: K1807597

Project: Liquid/2018 Northern Pike Tissue Study/Blanks

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | C |
|--------------------|-----------|--------|-----------------|--------|---|
| CCB 10/03/18 11:59 |           |        |                 |        |   |
|                    | Cobalt    | 6020A  | 609313          | 0.009  | U |
|                    | Copper    | 6020A  | 609313          | 0.05   | U |
|                    | Lead      | 6020A  | 609313          | 0.006  | U |
|                    | Manganese | 6020A  | 609313          | 0.04   | U |
|                    | Nickel    | 6020A  | 609313          | 0.04   | U |
|                    | Silver    | 6020A  | 609313          | 0.009  | U |
|                    | Thallium  | 6020A  | 609313          | 0.009  | U |
|                    | Uranium   | 6020A  | 609313          | 0.008  | U |
|                    | Vanadium  | 6020A  | 609313          | 0.06   | J |
|                    | Zinc      | 6020A  | 609313          | 0.5    | U |
| CCB 10/03/18 12:30 |           |        |                 |        |   |
|                    | Antimony  | 6020A  | 609313          | 0.020  | U |
|                    | Arsenic   | 6020A  | 609313          | 0.09   | U |
|                    | Barium    | 6020A  | 609313          | 0.020  | U |
|                    | Beryllium | 6020A  | 609313          | 0.006  | J |
|                    | Cadmium   | 6020A  | 609313          | 0.008  | U |
|                    | Chromium  | 6020A  | 609313          | 0.03   | U |
|                    | Cobalt    | 6020A  | 609313          | 0.009  | U |
|                    | Copper    | 6020A  | 609313          | 0.05   | U |
|                    | Lead      | 6020A  | 609313          | 0.006  | U |
|                    | Manganese | 6020A  | 609313          | 0.04   | U |
|                    | Nickel    | 6020A  | 609313          | 0.04   | U |
|                    | Silver    | 6020A  | 609313          | 0.009  | U |
|                    | Thallium  | 6020A  | 609313          | 0.009  | U |
|                    | Uranium   | 6020A  | 609313          | 0.008  | U |
|                    | Vanadium  | 6020A  | 609313          | 0.04   | U |
|                    | Zinc      | 6020A  | 609313          | 0.5    | U |
| CCB 10/03/18 12:37 |           |        |                 |        |   |
|                    | Antimony  | 6020A  | 609313          | 0.020  | U |
|                    | Arsenic   | 6020A  | 609313          | 0.09   | U |
|                    | Barium    | 6020A  | 609313          | 0.020  | U |
|                    | Beryllium | 6020A  | 609313          | 0.010  | J |
|                    | Cadmium   | 6020A  | 609313          | 0.008  | U |
|                    | Chromium  | 6020A  | 609313          | 0.03   | U |
|                    | Cobalt    | 6020A  | 609313          | 0.009  | U |
|                    | Copper    | 6020A  | 609313          | 0.05   | U |

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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result       | C |
|--------------------|-----------|--------|-----------------|--------------|---|
| CCB 10/03/18 12:37 | Lead      | 6020A  | 609313          | 0.006        | J |
|                    | Manganese | 6020A  | 609313          | 0.04         | U |
|                    | Nickel    | 6020A  | 609313          | 0.04         | U |
|                    | Silver    | 6020A  | 609313          | 0.009        | U |
|                    | Thallium  | 6020A  | 609313          | 0.018        | J |
|                    | Uranium   | 6020A  | 609313          | 0.008        | U |
|                    | Vanadium  | 6020A  | 609313          | 0.04         | U |
|                    | Zinc      | 6020A  | 609313          | 0.5          | U |
| CCB 10/03/18 12:58 | Uranium   | 6020A  | 609313          | 0.008        | U |
| ICB 10/03/18 11:19 | Aluminum  | 6010C  | 609389          | 4            | U |
|                    | Calcium   | 6010C  | 609389          | 0.9          | U |
|                    | Iron      | 6010C  | 609389          | 42x -4.30 -  | J |
|                    | Magnesium | 6010C  | 609389          | 0.3          | U |
|                    | Potassium | 6010C  | 609389          | 60           | U |
|                    | Sodium    | 6010C  | 609389          | 20           | U |
|                    | Sulfur    | 6010C  | 609389          | 6            | U |
| ICB 10/03/18 11:23 | Aluminum  | 6010C  | 609389          | 4            | U |
|                    | Calcium   | 6010C  | 609389          | 0.9          | U |
|                    | Iron      | 6010C  | 609389          | -8.00 -      | J |
|                    | Magnesium | 6010C  | 609389          | 42x -0.500 - | J |
|                    | Potassium | 6010C  | 609389          | 60           | U |
|                    | Sodium    | 6010C  | 609389          | 20           | U |
|                    | Sulfur    | 6010C  | 609389          | 6            | U |
| CCB 10/03/18 11:42 | Aluminum  | 6010C  | 609389          | 4            | U |
|                    | Calcium   | 6010C  | 609389          | 0.9          | U |
|                    | Iron      | 6010C  | 609389          | -6.80        | J |
|                    | Magnesium | 6010C  | 609389          | -0.600       | J |
|                    | Potassium | 6010C  | 609389          | 60           | U |
|                    | Sodium    | 6010C  | 609389          | 20           | U |
|                    | Sulfur    | 6010C  | 609389          | 6            | U |
| CCB 10/03/18 12:37 | Aluminum  | 6010C  | 609389          | 4            | U |

5-105  
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QA/QC Report

Client: Teck American Incorporated

Service Request: K1807597

Project: Liquid/2018 Northern Pike Tissue Study/Blanks

INITIAL AND CONTINUING CALIBRATION BLANKS

Concentration Units: ug/L

| Sample ID          | Analyte   | Method | Analysis Batch: | Result | C |
|--------------------|-----------|--------|-----------------|--------|---|
| CCB 10/03/18 12:37 | Calcium   | 6010C  | 609389          | 0.9    | U |
|                    | Iron      | 6010C  | 609389          | -6.40  | J |
|                    | Magnesium | 6010C  | 609389          | -0.500 | J |
|                    | Potassium | 6010C  | 609389          | 60     | U |
|                    | Sodium    | 6010C  | 609389          | 20     | U |
|                    | Sulfur    | 6010C  | 609389          | 6      | U |
| ICB 10/03/18 11:26 | Selenium  | 7742   | 609410          | 0.50   | U |
| CCB 10/03/18 11:33 | Selenium  | 7742   | 609410          | 0.50   | U |
| CCB 10/03/18 12:01 | Selenium  | 7742   | 609410          | 0.50   | U |

ALS Group USA, Corp.  
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Analytical Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ1811403-02 ✓

**Service Request:** K1807597

**Date Collected:** NA

**Date Received:** NA

**Basis:** NA

Total Metals

| Analyte Name | Analysis Method | Result  | Units | MRL | MDL | Dil. | Date Analyzed  | Date Extracted | Q |
|--------------|-----------------|---------|-------|-----|-----|------|----------------|----------------|---|
| Aluminum     | 6010C           | ND U    | ug/L  | 11  | 4   | 1    | 09/06/18 15:10 | 08/22/18       |   |
| Calcium      | 6010C           | 3 J ✓   | ug/L  | 21  | 0.9 | 1    | 09/06/18 15:10 | 08/22/18       |   |
| Iron         | 6010C           | 5 J ✓   | ug/L  | 21  | 3   | 1    | 09/06/18 15:10 | 08/22/18       |   |
| Magnesium    | 6010C           | 0.3 J ✓ | ug/L  | 5.3 | 0.3 | 1    | 09/06/18 15:10 | 08/22/18       |   |
| Potassium    | 6010C           | ND U    | ug/L  | 210 | 60  | 1    | 09/06/18 15:10 | 08/22/18       |   |
| Sodium       | 6010C           | ND U    | ug/L  | 210 | 20  | 1    | 09/06/18 15:10 | 08/22/18       |   |
| Sulfur       | 6010C           | ND U    | ug/L  | 170 | 6   | 1    | 09/06/18 15:10 | 08/22/18       |   |

All associated samples are RB/EB  
so no blank qualification was applied.



ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water  
  
**Sample Name:** Method Blank  
**Lab Code:** KQ1811637-02 ✓

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
  
**Basis:** NA

Total Metals

| Analyte Name | Analysis Method | Result  | Units | MRL | MDL | Dil. | Date Analyzed  | Date Extracted | Q |
|--------------|-----------------|---------|-------|-----|-----|------|----------------|----------------|---|
| Aluminum     | 6010C           | ND U    | ug/L  | 11  | 4   | 1    | 09/06/18 13:42 | 08/27/18       |   |
| Calcium      | 6010C           | 9 J ✓   | ug/L  | 21  | 0.9 | 1    | 09/06/18 13:42 | 08/27/18       |   |
| Iron         | 6010C           | 5 J ✓   | ug/L  | 21  | 3   | 1    | 09/06/18 13:42 | 08/27/18       |   |
| Magnesium    | 6010C           | 0.7 J ✓ | ug/L  | 5.3 | 0.3 | 1    | 09/06/18 13:42 | 08/27/18       |   |
| Potassium    | 6010C           | ND U    | ug/L  | 210 | 60  | 1    | 09/06/18 13:42 | 08/27/18       |   |
| Sodium       | 6010C           | ND U    | ug/L  | 210 | 20  | 1    | 09/06/18 13:42 | 08/27/18       |   |
| Sulfur       | 6010C           | ND U    | ug/L  | 170 | 6   | 1    | 09/06/18 13:42 | 08/27/18       |   |

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water  
  
**Sample Name:** Method Blank  
**Lab Code:** KQ1813871-03 ✓

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
  
**Basis:** NA

Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed  | Date Extracted | Q |
|--------------|-----------------|--------|-------|-----|-----|------|----------------|----------------|---|
| Aluminum     | 6010C           | ND U   | ug/L  | 11  | 4   | 1    | 10/03/18 12:19 | 10/02/18       |   |
| Calcium      | 6010C           | 4 J ✓  | ug/L  | 21  | 0.9 | 1    | 10/03/18 12:19 | 10/02/18       |   |
| Iron         | 6010C           | ND U   | ug/L  | 42  | 3   | 1    | 10/03/18 12:19 | 10/02/18       |   |
| Magnesium    | 6010C           | ND U   | ug/L  | 5.3 | 0.3 | 1    | 10/03/18 12:19 | 10/02/18       |   |
| Potassium    | 6010C           | ND U   | ug/L  | 210 | 60  | 1    | 10/03/18 12:19 | 10/02/18       |   |
| Sodium       | 6010C           | ND U   | ug/L  | 210 | 20  | 1    | 10/03/18 12:19 | 10/02/18       |   |
| Sulfur       | 6010C           | ND U   | ug/L  | 42  | 6   | 1    | 10/03/18 12:19 | 10/02/18       |   |

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water  
  
**Sample Name:** Method Blank  
**Lab Code:** KQ1811638-01

**Service Request:** K1807597

**Date Collected:** NA

**Date Received:** NA

**Basis:** NA

**Total Metals**

| <b>Analyte Name</b> | <b>Analysis Method</b> | <b>Result</b> | <b>Units</b> | <b>MRL</b> | <b>MDL</b> | <b>Dil.</b> | <b>Date Analyzed</b> | <b>Date Extracted</b> | <b>Q</b> |
|---------------------|------------------------|---------------|--------------|------------|------------|-------------|----------------------|-----------------------|----------|
| Antimony            | 6020A                  | ND U          | ug/L         | 0.050      | 0.020      | 1           | 08/30/18 15:32       | 08/27/18              |          |
| Arsenic             | 6020A                  | ND U          | ug/L         | 0.50       | 0.08       | 1           | 08/30/18 15:32       | 08/27/18              |          |
| Barium              | 6020A                  | ND U          | ug/L         | 0.050      | 0.020      | 1           | 08/30/18 15:32       | 08/27/18              |          |
| Beryllium           | 6020A                  | ND U          | ug/L         | 0.020      | 0.002      | 1           | 08/30/18 15:32       | 08/27/18              |          |
| Cadmium             | 6020A                  | ND U          | ug/L         | 0.020      | 0.009      | 1           | 08/30/18 15:32       | 08/27/18              |          |
| Chromium            | 6020A                  | ND U          | ug/L         | 0.20       | 0.03       | 1           | 08/30/18 15:32       | 08/27/18              |          |
| Cobalt              | 6020A                  | ND U          | ug/L         | 0.020      | 0.005      | 1           | 08/30/18 15:32       | 08/27/18              |          |
| Copper              | 6020A                  | ND U          | ug/L         | 0.10       | 0.02       | 1           | 08/30/18 15:32       | 08/27/18              |          |
| Lead                | 6020A                  | ND U          | ug/L         | 0.020      | 0.007      | 1           | 08/30/18 15:32       | 08/27/18              |          |
| Manganese           | 6020A                  | ND U          | ug/L         | 0.20       | 0.006      | 1           | 08/30/18 15:32       | 08/27/18              |          |
| Nickel              | 6020A                  | ND U          | ug/L         | 0.20       | 0.04       | 1           | 08/30/18 15:32       | 08/27/18              |          |
| Silver              | 6020A                  | ND U          | ug/L         | 0.020      | 0.002      | 1           | 08/30/18 15:32       | 08/27/18              |          |
| Thallium            | 6020A                  | ND U          | ug/L         | 0.020      | 0.008      | 1           | 08/30/18 15:32       | 08/27/18              |          |
| Uranium             | 6020A                  | ND U          | ug/L         | 0.020      | 0.005      | 1           | 08/30/18 15:32       | 08/27/18              |          |
| Vanadium            | 6020A                  | ND U          | ug/L         | 0.20       | 0.04       | 1           | 08/30/18 15:32       | 08/27/18              |          |
| Zinc                | 6020A                  | ND U          | ug/L         | 2.0        | 0.08       | 1           | 08/30/18 15:32       | 08/27/18              |          |

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water  
  
**Sample Name:** Method Blank  
**Lab Code:** KQ1812163-01 ✓

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
  
**Basis:** NA

Total Metals

| Analyte Name | Analysis Method | Result    | Units | MRL   | MDL   | Dil. | Date Analyzed  | Date Extracted | Q |
|--------------|-----------------|-----------|-------|-------|-------|------|----------------|----------------|---|
| Antimony     | 6020A           | ND U      | ug/L  | 0.050 | 0.020 | 1    | 09/07/18 16:13 | 09/04/18       |   |
| Arsenic      | 6020A           | ND U      | ug/L  | 0.50  | 0.08  | 1    | 09/07/18 16:13 | 09/04/18       |   |
| Barium       | 6020A           | ND U      | ug/L  | 0.050 | 0.020 | 1    | 09/07/18 16:13 | 09/04/18       |   |
| Beryllium    | 6020A           | ND U      | ug/L  | 0.020 | 0.002 | 1    | 09/07/18 16:13 | 09/04/18       |   |
| Cadmium      | 6020A           | 0.011 J ✓ | ug/L  | 0.020 | 0.009 | 1    | 09/07/18 16:13 | 09/04/18       |   |
| Chromium     | 6020A           | ND U      | ug/L  | 0.20  | 0.03  | 1    | 09/07/18 16:13 | 09/04/18       |   |
| Cobalt       | 6020A           | ND U      | ug/L  | 0.020 | 0.005 | 1    | 09/07/18 16:13 | 09/04/18       |   |
| Copper       | 6020A           | 0.02 J ✓  | ug/L  | 0.10  | 0.02  | 1    | 09/07/18 16:13 | 09/04/18       |   |
| Lead         | 6020A           | 0.009 J ✓ | ug/L  | 0.020 | 0.007 | 1    | 09/07/18 16:13 | 09/04/18       |   |
| Manganese    | 6020A           | 0.04 J ✓  | ug/L  | 0.20  | 0.006 | 1    | 09/07/18 16:13 | 09/04/18       |   |
| Nickel       | 6020A           | ND U      | ug/L  | 0.20  | 0.04  | 1    | 09/07/18 16:13 | 09/04/18       |   |
| Silver       | 6020A           | ND U      | ug/L  | 0.020 | 0.002 | 1    | 09/07/18 16:13 | 09/04/18       |   |
| Thallium     | 6020A           | ND U      | ug/L  | 0.020 | 0.008 | 1    | 09/07/18 16:13 | 09/04/18       |   |
| Uranium      | 6020A           | ND U      | ug/L  | 0.020 | 0.005 | 1    | 09/07/18 16:13 | 09/04/18       |   |
| Vanadium     | 6020A           | ND U      | ug/L  | 0.20  | 0.04  | 1    | 09/07/18 16:13 | 09/04/18       |   |
| Zinc         | 6020A           | 0.2 J ✓   | ug/L  | 2.0   | 0.08  | 1    | 09/07/18 16:13 | 09/04/18       |   |

**ALS Group USA, Corp.**  
dba ALS Environmental

Analytical Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ1813873-01 ✓

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Basis:** NA

**Total Metals**

| Analyte Name | Analysis Method | Result | Units | MRL   | MDL   | Dil. | Date Analyzed  | Date Extracted | Q |
|--------------|-----------------|--------|-------|-------|-------|------|----------------|----------------|---|
| Antimony     | 6020A           | ND U   | ug/L  | 0.050 | 0.020 | 1    | 10/03/18 09:39 | 10/02/18       |   |
| Arsenic      | 6020A           | ND U   | ug/L  | 0.50  | 0.09  | 1    | 10/03/18 09:39 | 10/02/18       |   |
| Barium       | 6020A           | ND U   | ug/L  | 0.050 | 0.020 | 1    | 10/03/18 09:39 | 10/02/18       |   |
| Beryllium    | 6020A           | ND U   | ug/L  | 0.020 | 0.005 | 1    | 10/03/18 09:39 | 10/02/18       |   |
| Cadmium      | 6020A           | ND U   | ug/L  | 0.020 | 0.008 | 1    | 10/03/18 09:39 | 10/02/18       |   |
| Chromium     | 6020A           | ND U   | ug/L  | 0.20  | 0.03  | 1    | 10/03/18 09:39 | 10/02/18       |   |
| Cobalt       | 6020A           | ND U   | ug/L  | 0.020 | 0.009 | 1    | 10/03/18 09:39 | 10/02/18       |   |
| Copper       | 6020A           | ND U   | ug/L  | 0.10  | 0.05  | 1    | 10/03/18 09:39 | 10/02/18       |   |
| Lead         | 6020A           | ND U   | ug/L  | 0.020 | 0.006 | 1    | 10/03/18 09:39 | 10/02/18       |   |
| Manganese    | 6020A           | ND U   | ug/L  | 0.20  | 0.04  | 1    | 10/03/18 09:39 | 10/02/18       |   |
| Nickel       | 6020A           | ND U   | ug/L  | 0.20  | 0.04  | 1    | 10/03/18 09:39 | 10/02/18       |   |
| Silver       | 6020A           | ND U   | ug/L  | 0.020 | 0.009 | 1    | 10/03/18 09:39 | 10/02/18       |   |
| Thallium     | 6020A           | ND U   | ug/L  | 0.020 | 0.009 | 1    | 10/03/18 09:39 | 10/02/18       |   |
| Uranium      | 6020A           | ND U   | ug/L  | 0.020 | 0.008 | 1    | 10/03/18 09:39 | 10/02/18       |   |
| Vanadium     | 6020A           | ND U   | ug/L  | 0.20  | 0.04  | 1    | 10/03/18 09:39 | 10/02/18       |   |
| Zinc         | 6020A           | ND U   | ug/L  | 2.0   | 0.5   | 1    | 10/03/18 09:39 | 10/02/18       |   |

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ1811402-01 ✓

**Service Request:** K1807597

**Date Collected:** NA

**Date Received:** NA

**Basis:** NA

Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed  | Date Extracted | Q |
|--------------|-----------------|--------|-------|-----|-----|------|----------------|----------------|---|
| Selenium     | 7742            | ND U   | ug/L  | 1.0 | 0.2 | 2    | 08/28/18 11:21 | 08/23/18       |   |

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ1811639-01 ✓

**Service Request:** K1807597

**Date Collected:** NA

**Date Received:** NA

**Basis:** NA

Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed  | Date Extracted | Q |
|--------------|-----------------|--------|-------|-----|-----|------|----------------|----------------|---|
| Selenium     | 7742            | ND U   | ug/L  | 1.0 | 0.2 | 2    | 08/28/18 11:53 | 08/27/18       |   |

ALS Group USA, Corp.  
dba ALS Environmental

Analytical Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water  
**Sample Name:** Method Blank  
**Lab Code:** KQ1813872-01 ✓

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Basis:** NA

Total Metals

| Analyte Name | Analysis Method | Result | Units | MRL | MDL | Dil. | Date Analyzed  | Date Extracted | Q |
|--------------|-----------------|--------|-------|-----|-----|------|----------------|----------------|---|
| Selenium     | 7742            | ND U ✓ | ug/L  | 1.0 | 0.2 | 2    | 10/03/18 11:35 | 10/02/18       |   |



ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

ICP INTERFERENCE CHECK SAMPLE

Sample ID ICSA

Concentration Units: ug/L

| Analyte   | Method | Analysis Batch: | Result   | True Value | ✓<br>% Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|--------|-----------------|----------|------------|------------|------------------|----------------|
| Calcium   | 6010C  | 605558          | 489000 ✓ | -          | 98 -       | -                | 09/06/18 13:00 |
| Iron      | 6010C  | 605558          | 193000   | -          | 96 -       | -                | 09/06/18 13:00 |
| Magnesium | 6010C  | 605558          | 514000 ✓ | -          | 103 -      | -                | 09/06/18 13:00 |
| Potassium | 6010C  | 605558          | -103 ✓   | -          | -          | -                | 09/06/18 13:00 |
| Sodium    | 6010C  | 605558          | 20 U     | -          | -          | -                | 09/06/18 13:00 |
| Sulfur    | 6010C  | 605558          | -15.4 ✓  | -          | -          | -                | 09/06/18 13:00 |

80-120

Low interferences in samples,  
no impact

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

ICP INTERFERENCE CHECK SAMPLE

Sample ID ICSAB

Concentration Units: ug/L

| Analyte   | Method | Analysis Batch: | Result   | True Value | ✓<br>% Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|--------|-----------------|----------|------------|------------|------------------|----------------|
| Calcium   | 6010C  | 605558          | 487000   | -          | 97 -       | -                | 09/06/18 13:02 |
| Iron      | 6010C  | 605558          | 193000 ✓ | -          | 96 -       | -                | 09/06/18 13:02 |
| Magnesium | 6010C  | 605558          | 513000   | -          | 103 -      | -                | 09/06/18 13:02 |
| Potassium | 6010C  | 605558          | 60 U     | -          | -          | -                | 09/06/18 13:02 |
| Sodium    | 6010C  | 605558          | 30 ✓     | -          | -          | -                | 09/06/18 13:02 |
| Sulfur    | 6010C  | 605558          | -11.8 ✓  | -          | -          | -                | 09/06/18 13:02 |

80-120

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

ICP INTERFERENCE CHECK SAMPLE

Sample ID ICSA

Concentration Units: ug/L

| Analyte   | Method | Analysis Batch: | Result   | True Value | <div>✓<br/>% Rec</div> | <div>% Rec.<br/>Limits</div> | Analysis Date  |
|-----------|--------|-----------------|----------|------------|------------------------|------------------------------|----------------|
| Calcium   | 6010C  | 609389          | 501000 ✓ | -          | - 100                  | -                            | 10/03/18 11:44 |
| Iron      | 6010C  | 609389          | 191000 ✓ | -          | - 96                   | -                            | 10/03/18 11:44 |
| Potassium | 6010C  | 609389          | 60 U     | -          | -                      | -                            | 10/03/18 11:44 |
| Sodium    | 6010C  | 609389          | 20 U     | -          | -                      | -                            | 10/03/18 11:44 |
| Sulfur    | 6010C  | 609389          | 11 ✓     | -          | -                      | -                            | 10/03/18 11:44 |

80-120

Low interferants in samples,  
no impact

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

ICP INTERFERENCE CHECK SAMPLE

Sample ID ICSAB

Concentration Units: ug/L

| Analyte   | Method | Analysis Batch: | Result   | True Value | % Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|--------|-----------------|----------|------------|-------|------------------|----------------|
| Calcium   | 6010C  | 609389          | 498000 - | -          | - 100 | -                | 10/03/18 11:47 |
| Iron      | 6010C  | 609389          | 191000 - | -          | - 96  | -                | 10/03/18 11:47 |
| Potassium | 6010C  | 609389          | -68.8    | -          | -     | -                | 10/03/18 11:47 |
| Sodium    | 6010C  | 609389          | 20 ✓     | -          | -     | -                | 10/03/18 11:47 |
| Sulfur    | 6010C  | 609389          | 19 -     | -          | -     | -                | 10/03/18 11:47 |

80-120

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

ICP INTERFERENCE CHECK SAMPLE

Sample ID ICSA

Concentration Units: ug/L

| Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|--------|-----------------|--------|------------|-------|------------------|----------------|
| Antimony  | 6020A  | 604716          | 0.092  | -          | -     | -                | 08/30/18 12:00 |
| Arsenic   | 6020A  | 604716          | 0.28 ✓ | -          | -     | -                | 08/30/18 12:00 |
| Barium    | 6020A  | 604716          | 0.276  | -          | -     | -                | 08/30/18 12:00 |
| Beryllium | 6020A  | 604716          | 0.007  | -          | -     | -                | 08/30/18 12:00 |
| Cadmium   | 6020A  | 604716          | 0.056  | -          | -     | -                | 08/30/18 12:00 |
| Chromium  | 6020A  | 604716          | 1.31   | -          | -     | -                | 08/30/18 12:00 |
| Cobalt    | 6020A  | 604716          | 1.30   | -          | -     | -                | 08/30/18 12:00 |
| Copper    | 6020A  | 604716          | 0.78 ✓ | -          | -     | -                | 08/30/18 12:00 |
| Lead      | 6020A  | 604716          | 0.143  | -          | -     | -                | 08/30/18 12:00 |
| Manganese | 6020A  | 604716          | 1.18   | -          | -     | -                | 08/30/18 12:00 |
| Nickel    | 6020A  | 604716          | 1.50   | -          | -     | -                | 08/30/18 12:00 |
| Selenium  | 6020A  | 604716          | 0.2    | -          | -     | -                | 08/30/18 12:00 |
| Silver    | 6020A  | 604716          | 0.008  | -          | -     | -                | 08/30/18 12:00 |
| Thallium  | 6020A  | 604716          | 0.008  | -          | -     | -                | 08/30/18 12:00 |
| Uranium   | 6020A  | 604716          | 0.005  | -          | -     | -                | 08/30/18 12:00 |
| Vanadium  | 6020A  | 604716          | 0.04   | -          | -     | -                | 08/30/18 12:00 |
| Zinc      | 6020A  | 604716          | 0.4 ✓  | -          | -     | -                | 08/30/18 12:00 |

Al 20000  
Fe 50000  
Mo 50

Low interferences in samples,  
no impact

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks

**Service Request:** K1807597

ICP INTERFERENCE CHECK SAMPLE

Sample ID ICSAB

Concentration Units: ug/L

| Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|--------|-----------------|--------|------------|-------|------------------|----------------|
| Antimony  | 6020A  | 604716          | 0.086  | -          | -     | -                | 08/30/18 12:04 |
| Arsenic   | 6020A  | 604716          | 25.1   | 25.0       | 100   | 80-120           | 08/30/18 12:04 |
| Barium    | 6020A  | 604716          | 0.308  | -          | -     | -                | 08/30/18 12:04 |
| Beryllium | 6020A  | 604716          | 0.006  | -          | -     | -                | 08/30/18 12:04 |
| Cadmium   | 6020A  | 604716          | 24.7   | 25.0       | 99    | 80-120           | 08/30/18 12:04 |
| Chromium  | 6020A  | 604716          | 51.6 ✓ | 50.0       | 103 ✓ | 80-120           | 08/30/18 12:04 |
| Cobalt    | 6020A  | 604716          | 50.9   | 50.0       | 102   | 80-120           | 08/30/18 12:04 |
| Copper    | 6020A  | 604716          | 45.5   | 50.0       | 91    | 80-120           | 08/30/18 12:04 |
| Lead      | 6020A  | 604716          | 0.151  | -          | -     | -                | 08/30/18 12:04 |
| Manganese | 6020A  | 604716          | 48.9   | 50.0       | 98    | 80-120           | 08/30/18 12:04 |
| Nickel    | 6020A  | 604716          | 48.6 ✓ | 50.0       | 97 ✓  | 80-120           | 08/30/18 12:04 |
| Selenium  | 6020A  | 604716          | 24.0   | 25.0       | 96    | 80-120           | 08/30/18 12:04 |
| Silver    | 6020A  | 604716          | 11.6   | 12.5       | 93    | 80-120           | 08/30/18 12:04 |
| Thallium  | 6020A  | 604716          | 0.009  | -          | -     | -                | 08/30/18 12:04 |
| Uranium   | 6020A  | 604716          | 0.006  | -          | -     | -                | 08/30/18 12:04 |
| Vanadium  | 6020A  | 604716          | 52.4   | 50.0       | 105   | 80-120           | 08/30/18 12:04 |
| Zinc      | 6020A  | 604716          | 21.2   | 25.0       | 85    | 80-120           | 08/30/18 12:04 |

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks

**Service Request:** K1807597

ICP INTERFERENCE CHECK SAMPLE

Sample ID ICSA

Concentration Units: ug/L

| Analyte   | Method | Analysis Batch: | Result  | True Value | % Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|--------|-----------------|---------|------------|-------|------------------|----------------|
| Antimony  | 6020A  | 605777          | 0.088   | -          | -     | -                | 09/07/18 16:04 |
| Arsenic   | 6020A  | 605777          | 0.24    | -          | -     | -                | 09/07/18 16:04 |
| Barium    | 6020A  | 605777          | 0.275   | -          | -     | -                | 09/07/18 16:04 |
| Beryllium | 6020A  | 605777          | 0.007   | -          | -     | -                | 09/07/18 16:04 |
| Cadmium   | 6020A  | 605777          | 0.045 ✓ | -          | -     | -                | 09/07/18 16:04 |
| Chromium  | 6020A  | 605777          | 1.35    | -          | -     | -                | 09/07/18 16:04 |
| Cobalt    | 6020A  | 605777          | 1.31    | -          | -     | -                | 09/07/18 16:04 |
| Copper    | 6020A  | 605777          | 0.76    | -          | -     | -                | 09/07/18 16:04 |
| Lead      | 6020A  | 605777          | 0.145   | -          | -     | -                | 09/07/18 16:04 |
| Manganese | 6020A  | 605777          | 1.20    | -          | -     | -                | 09/07/18 16:04 |
| Nickel    | 6020A  | 605777          | 1.55    | -          | -     | -                | 09/07/18 16:04 |
| Selenium  | 6020A  | 605777          | 0.2     | -          | -     | -                | 09/07/18 16:04 |
| Silver    | 6020A  | 605777          | 0.008 ✓ | -          | -     | -                | 09/07/18 16:04 |
| Thallium  | 6020A  | 605777          | 0.008   | -          | -     | -                | 09/07/18 16:04 |
| Uranium   | 6020A  | 605777          | 0.006   | -          | -     | -                | 09/07/18 16:04 |
| Vanadium  | 6020A  | 605777          | 0.04    | -          | -     | -                | 09/07/18 16:04 |
| Zinc      | 6020A  | 605777          | 0.3     | -          | -     | -                | 09/07/18 16:04 |

Al 20000  
Fe 50000  
Mo 50

Low interferences in samples,  
no impact

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

ICP INTERFERENCE CHECK SAMPLE

Sample ID ICSAB

Concentration Units: ug/L

| Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|--------|-----------------|--------|------------|-------|------------------|----------------|
| Antimony  | 6020A  | 605777          | 0.094  | -          | -     | -                | 09/07/18 16:08 |
| Arsenic   | 6020A  | 605777          | 24.9 ✓ | 25.0       | 100 ✓ | 80-120           | 09/07/18 16:08 |
| Barium    | 6020A  | 605777          | 0.282  | -          | -     | -                | 09/07/18 16:08 |
| Beryllium | 6020A  | 605777          | 0.007  | -          | -     | -                | 09/07/18 16:08 |
| Cadmium   | 6020A  | 605777          | 24.3   | 25.0       | 97    | 80-120           | 09/07/18 16:08 |
| Chromium  | 6020A  | 605777          | 51.5   | 50.0       | 103   | 80-120           | 09/07/18 16:08 |
| Cobalt    | 6020A  | 605777          | 51.0   | 50.0       | 102   | 80-120           | 09/07/18 16:08 |
| Copper    | 6020A  | 605777          | 45.8 ✓ | 50.0       | 92 ✓  | 80-120           | 09/07/18 16:08 |
| Lead      | 6020A  | 605777          | 0.146  | -          | -     | -                | 09/07/18 16:08 |
| Manganese | 6020A  | 605777          | 49.6   | 50.0       | 99    | 80-120           | 09/07/18 16:08 |
| Nickel    | 6020A  | 605777          | 48.5   | 50.0       | 97    | 80-120           | 09/07/18 16:08 |
| Selenium  | 6020A  | 605777          | 24.2   | 25.0       | 97    | 80-120           | 09/07/18 16:08 |
| Silver    | 6020A  | 605777          | 11.3   | 12.5       | 90    | 80-120           | 09/07/18 16:08 |
| Thallium  | 6020A  | 605777          | 0.009  | -          | -     | -                | 09/07/18 16:08 |
| Uranium   | 6020A  | 605777          | 0.006  | -          | -     | -                | 09/07/18 16:08 |
| Vanadium  | 6020A  | 605777          | 51.2 ✓ | 50.0       | 102 ✓ | 80-120           | 09/07/18 16:08 |
| Zinc      | 6020A  | 605777          | 21.0   | 25.0       | 84    | 80-120           | 09/07/18 16:08 |



ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

ICP INTERFERENCE CHECK SAMPLE

Sample ID ICSA

Concentration Units: ug/L

| Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|--------|-----------------|--------|------------|-------|------------------|----------------|
| Antimony  | 6020A  | 609313          | 0.082  | -          | -     | -                | 10/03/18 09:28 |
| Arsenic   | 6020A  | 609313          | 0.30   | -          | -     | -                | 10/03/18 09:28 |
| Barium    | 6020A  | 609313          | 0.279  | -          | -     | -                | 10/03/18 09:28 |
| Beryllium | 6020A  | 609313          | 0.007  | -          | -     | -                | 10/03/18 09:28 |
| Cadmium   | 6020A  | 609313          | 0.029✓ | -          | -     | -                | 10/03/18 09:28 |
| Chromium  | 6020A  | 609313          | 1.25   | -          | -     | -                | 10/03/18 09:28 |
| Cobalt    | 6020A  | 609313          | 1.15   | -          | -     | -                | 10/03/18 09:28 |
| Copper    | 6020A  | 609313          | 0.80   | -          | -     | -                | 10/03/18 09:28 |
| Lead      | 6020A  | 609313          | 0.170  | -          | -     | -                | 10/03/18 09:28 |
| Manganese | 6020A  | 609313          | 1.09   | -          | -     | -                | 10/03/18 09:28 |
| Nickel    | 6020A  | 609313          | 1.92✓  | -          | -     | -                | 10/03/18 09:28 |
| Silver    | 6020A  | 609313          | 0.012  | -          | -     | -                | 10/03/18 09:28 |
| Thallium  | 6020A  | 609313          | 0.011  | -          | -     | -                | 10/03/18 09:28 |
| Uranium   | 6020A  | 609313          | 0.008  | -          | -     | -                | 10/03/18 09:28 |
| Vanadium  | 6020A  | 609313          | 0.09   | -          | -     | -                | 10/03/18 09:28 |
| Zinc      | 6020A  | 609313          | 0.9    | -          | -     | -                | 10/03/18 09:28 |

Al 20000

Mo 50

Low interferences in samples,  
no impact

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

ICP INTERFERENCE CHECK SAMPLE

Sample ID ICSAB

Concentration Units: ug/L

| Analyte   | Method | Analysis Batch: | Result | True Value | % Rec | % Rec.<br>Limits | Analysis Date  |
|-----------|--------|-----------------|--------|------------|-------|------------------|----------------|
| Antimony  | 6020A  | 609313          | 0.080  | -          | -     | -                | 10/03/18 09:31 |
| Arsenic   | 6020A  | 609313          | 23.5 ✓ | 25.0       | 94 ✓  | 80-120           | 10/03/18 09:31 |
| Barium    | 6020A  | 609313          | 0.268  | -          | -     | -                | 10/03/18 09:31 |
| Beryllium | 6020A  | 609313          | 0.005  | -          | -     | -                | 10/03/18 09:31 |
| Cadmium   | 6020A  | 609313          | 24.3   | 25.0       | 97    | 80-120           | 10/03/18 09:31 |
| Chromium  | 6020A  | 609313          | 46.0   | 50.0       | 92    | 80-120           | 10/03/18 09:31 |
| Cobalt    | 6020A  | 609313          | 46.0   | 50.0       | 92    | 80-120           | 10/03/18 09:31 |
| Copper    | 6020A  | 609313          | 44.7   | 50.0       | 89    | 80-120           | 10/03/18 09:31 |
| Lead      | 6020A  | 609313          | 0.164  | -          | -     | -                | 10/03/18 09:31 |
| Manganese | 6020A  | 609313          | 46.0 ✓ | 50.0       | 92 ✓  | 80-120           | 10/03/18 09:31 |
| Nickel    | 6020A  | 609313          | 46.0   | 50.0       | 92    | 80-120           | 10/03/18 09:31 |
| Silver    | 6020A  | 609313          | 11.9   | 12.5       | 95    | 80-120           | 10/03/18 09:31 |
| Thallium  | 6020A  | 609313          | 0.013  | -          | -     | -                | 10/03/18 09:31 |
| Uranium   | 6020A  | 609313          | 0.008  | -          | -     | -                | 10/03/18 09:31 |
| Vanadium  | 6020A  | 609313          | 45.2   | 50.0       | 90    | 80-120           | 10/03/18 09:31 |
| Zinc      | 6020A  | 609313          | 22.3   | 25.0       | 89    | 80-120           | 10/03/18 09:31 |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** 08/14/18  
**Date Received:** 08/15/18  
**Date Analyzed:** 09/6/18  
**Date Extracted:** 08/22/18

**Matrix Spike Summary**  
**Total Metals**

**Sample Name:** Rinsate Blank-Northern Pike 8/14  
**Lab Code:** K1807597-002 ✓  
**Analysis Method:** 6010C  
**Prep Method:** EPA CLP-METALS ILM04.0

**Units:** ug/L  
**Basis:** NA

**Matrix Spike**  
KQ1811403-04 ✓

| Analyte Name | Sample Result | Result | Spike Amount | % Rec | % Rec Limits |
|--------------|---------------|--------|--------------|-------|--------------|
| Aluminum     | ND U          | 1790   | 2000         | 90    | 75-125 ✓     |
| Calcium      | 11 J          | 9150 ✓ | 10000        | 91 ✓  | 75-125       |
| Iron         | 7 J           | 931    | 1000         | 92    | 75-125       |
| Magnesium    | 2.7 J         | 8770   | 10000        | 88    | 75-125       |
| Potassium    | ND U          | 9210   | 10000        | 92    | 75-125       |
| Sodium       | 40 J          | 9110 ✓ | 10000        | 91 ✓  | 75-125       |
| Sulfur       | 10 J          | 9020   | 10000        | 90    | 75-125       |

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Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** 08/17/18  
**Date Received:** 08/21/18  
**Date Analyzed:** 09/6/18  
**Date Extracted:** 08/27/18

**Matrix Spike Summary**  
**Total Metals**

**Sample Name:** Rinsate Blank-Northern Pike 8/17  
**Lab Code:** K1807597-008 ✓  
**Analysis Method:** 6010C  
**Prep Method:** EPA CLP-METALS ILM04.0

**Units:** ug/L  
**Basis:** NA

**Matrix Spike**  
KQ1811637-04

| Analyte Name | Sample Result | Result | Spike Amount | % Rec | % Rec Limits |
|--------------|---------------|--------|--------------|-------|--------------|
| Aluminum     | ND U          | 1730 ✓ | 2000         | 87 ✓  | 75-125 ✓     |
| Calcium      | 6 J           | 9280   | 10000        | 93    | 75-125       |
| Iron         | 4 J           | 912    | 1000         | 91    | 75-125       |
| Magnesium    | 0.7 J         | 9190   | 10000        | 92    | 75-125       |
| Potassium    | ND U          | 9310 ✓ | 10000        | 93 ✓  | 75-125       |
| Sodium       | ND U          | 9160   | 10000        | 92    | 75-125       |
| Sulfur       | ND U          | 8600   | 10000        | 86    | 75-125       |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** 08/17/18  
**Date Received:** 08/21/18  
**Date Analyzed:** 08/30/18  
**Date Extracted:** 08/27/18

**Matrix Spike Summary**  
**Total Metals**

**Sample Name:** Homogenization Blank-Northern Pike 8/17  
**Lab Code:** K1807597-009 ✓  
**Analysis Method:** 6020A  
**Prep Method:** EPA CLP-METALS ILM04.0

**Units:** ug/L  
**Basis:** NA

**Matrix Spike**  
KQ1811638-04 ✓

| Analyte Name | Sample Result | Result | Spike Amount | % Rec | % Rec Limits |
|--------------|---------------|--------|--------------|-------|--------------|
| Antimony     | ND U          | 9.77   | 10.0         | 98    | 75-125 ✓     |
| Arsenic      | ND U          | 48.8   | 50.0         | 98    | 75-125       |
| Barium       | ND U          | 97.5   | 100          | 98    | 75-125       |
| Beryllium    | ND U          | 2.53   | 2.50         | 101   | 75-125       |
| Cadmium      | ND U          | 24.4   | 25.0         | 98    | 75-125       |
| Chromium     | ND U          | 9.79 ✓ | 10.0         | 98 ✓  | 75-125       |
| Cobalt       | ND U          | 24.5   | 25.0         | 98    | 75-125       |
| Copper       | 0.11          | 12.2   | 12.5         | 97    | 75-125       |
| Lead         | ND U          | 49.4   | 50.0         | 99    | 75-125       |
| Manganese    | 0.07 J        | 24.3   | 25.0         | 97    | 75-125       |
| Nickel       | ND U          | 24.5   | 25.0         | 98    | 75-125       |
| Silver       | ND U          | 12.0   | 12.5         | 96    | 75-125       |
| Thallium     | ND U          | 48.0   | 50.0         | 96    | 75-125       |
| Uranium      | ND U          | 19.5 ✓ | 20.0         | 97 ✓  | 75-125       |
| Vanadium     | ND U          | 24.3   | 25.0         | 97    | 75-125       |
| Zinc         | 3.1           | 26.3   | 25.0         | 93    | 75-125       |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** 08/14/18  
**Date Received:** 08/15/18  
**Date Analyzed:** 09/7/18  
**Date Extracted:** 09/4/18

**Matrix Spike Summary**  
**Total Metals**

**Sample Name:** Homogenization Blank-Northern Pike 8/14  
**Lab Code:** K1807597-004 ✓  
**Analysis Method:** 6020A  
**Prep Method:** EPA CLP-METALS ILM04.0

**Units:** ug/L  
**Basis:** NA

**Matrix Spike**  
KQ1812163-04 ✓

| Analyte Name | Sample Result | Result | Spike Amount | % Rec | % Rec Limits |
|--------------|---------------|--------|--------------|-------|--------------|
| Antimony     | ND U          | 9.55   | 10.0         | 95    | 75-125 ✓     |
| Arsenic      | ND U          | 47.6   | 50.0         | 95    | 75-125       |
| Barium       | 0.021 J       | 95.7   | 100          | 96    | 75-125       |
| Beryllium    | ND U          | 2.51 ✓ | 2.50         | 100 ✓ | 75-125       |
| Cadmium      | ND U          | 24.1   | 25.0         | 96    | 75-125       |
| Chromium     | 0.03 J        | 9.89   | 10.0         | 99    | 75-125       |
| Cobalt       | ND U          | 25.1   | 25.0         | 100   | 75-125       |
| Copper       | ND U          | 12.7   | 12.5         | 101   | 75-125       |
| Lead         | ND U          | 48.9   | 50.0         | 98    | 75-125       |
| Manganese    | 0.02 J        | 25.0 ✓ | 25.0         | 100 ✓ | 75-125       |
| Nickel       | ND U          | 24.9   | 25.0         | 100   | 75-125       |
| Silver       | ND U          | 12.2   | 12.5         | 98    | 75-125       |
| Thallium     | ND U          | 48.7   | 50.0         | 97    | 75-125       |
| Uranium      | ND U          | 20.1   | 20.0         | 100   | 75-125       |
| Vanadium     | ND U          | 24.9   | 25.0         | 100   | 75-125       |
| Zinc         | 4.6           | 27.7   | 25.0         | 92    | 75-125       |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** 08/17/18  
**Date Received:** 08/21/18  
**Date Analyzed:** 08/28/18  
**Date Extracted:** 08/27/18

**Matrix Spike Summary**  
**Total Metals**

**Sample Name:** Homogenization Blank-Northern Pike 8/17  
**Lab Code:** K1807597-010  
**Analysis Method:** 7742  
**Prep Method:** EPA 3010A

**Units:** ug/L  
**Basis:** NA

**Matrix Spike**  
KQ1811639-04

| Analyte Name | Sample Result | Result | Spike Amount | % Rec | % Rec Limits |
|--------------|---------------|--------|--------------|-------|--------------|
| Selenium     | ND U          | 15.8   | 16.0         | 99    | 75-125       |

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Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

POST SPIKE SAMPLE RECOVERY

Concentration Units: ug/L

| Sample ID     | Analyte   | Method | Analysis Batch: | Initial Sample Result | Post Spike Result | True Value | % Rec | % Rec. Limits | Analysis Date  |
|---------------|-----------|--------|-----------------|-----------------------|-------------------|------------|-------|---------------|----------------|
| K1807597-001A | Selenium  | 7742   | 604386          | 0.2 U                 | 2.6 ✓             | 2.5        | 104 ✓ | 80-120 ✓      | 08/28/18 11:28 |
| K1807597-010A | Selenium  | 7742   | 604386          | 0.2 U                 | 2.7 ✓             | 2.5        | 106 ✓ | 80-120        | 08/28/18 12:00 |
| K1807597-009A | Antimony  | 6020A  | 604716          | 0.020 U               | 19.3              | 20.0       | 97    | 80-120        | 08/30/18 16:11 |
|               | Arsenic   | 6020A  | 604716          | 0.08 U                | 19.0              | 20.0       | 95    | 80-120        | 08/30/18 16:11 |
|               | Barium    | 6020A  | 604716          | 0.020 U               | 19.9              | 20.0       | 99    | 80-120        | 08/30/18 16:11 |
|               | Beryllium | 6020A  | 604716          | 0.002 U               | 19.7              | 20.0       | 98    | 80-120        | 08/30/18 16:11 |
|               | Cadmium   | 6020A  | 604716          | 0.009 U               | 18.9 ✓            | 20.0       | 94 ✓  | 80-120        | 08/30/18 16:11 |
|               | Chromium  | 6020A  | 604716          | 0.03 U                | 19.6              | 20.0       | 98    | 80-120        | 08/30/18 16:11 |
|               | Cobalt    | 6020A  | 604716          | 0.005 U ✓             | 19.4              | 20.0       | 97    | 80-120        | 08/30/18 16:11 |
|               | Copper    | 6020A  | 604716          | 0.11 ✓                | 19.3              | 20.0       | 96    | 80-120        | 08/30/18 16:11 |
|               | Lead      | 6020A  | 604716          | 0.007 U               | 19.4              | 20.0       | 97    | 80-120        | 08/30/18 16:11 |
|               | Manganese | 6020A  | 604716          | 0.07 J                | 19.3              | 20.0       | 96    | 80-120        | 08/30/18 16:11 |
|               | Nickel    | 6020A  | 604716          | 0.04 U                | 19.1              | 20.0       | 95    | 80-120        | 08/30/18 16:11 |
|               | Silver    | 6020A  | 604716          | 0.002 U               | 9.63              | 10.0       | 96    | 80-120        | 08/30/18 16:11 |
|               | Thallium  | 6020A  | 604716          | 0.008 U               | 19.1 ✓            | 20.0       | 95 ✓  | 80-120        | 08/30/18 16:11 |
|               | Uranium   | 6020A  | 604716          | 0.005 U               | 19.3              | 20.0       | 96    | 80-120        | 08/30/18 16:11 |
|               | Vanadium  | 6020A  | 604716          | 0.04 U                | 19.5              | 20.0       | 98    | 80-120        | 08/30/18 16:11 |
|               | Zinc      | 6020A  | 604716          | 3.1                   | 21.2              | 20.0       | 91    | 80-120        | 08/30/18 16:11 |
| K1807597-002A | Aluminum  | 6010C  | 605558          | 4 U                   | 5110 ✓            | 5000       | 102 ✓ | 80-120        | 09/06/18 16:01 |
|               | Calcium   | 6010C  | 605558          | 10 J                  | 12600             | 12500      | 101   | 80-120        | 09/06/18 16:01 |
|               | Iron      | 6010C  | 605558          | 6 J                   | 2510 ✓            | 2500       | 100   | 80-120        | 09/06/18 16:01 |
|               | Magnesium | 6010C  | 605558          | 2.6 J ✓               | 12400             | 12500      | 99    | 80-120        | 09/06/18 16:01 |
|               | Potassium | 6010C  | 605558          | 60 U                  | 12500 ✓           | 12500      | 100 ✓ | 80-120        | 09/06/18 16:01 |
|               | Sodium    | 6010C  | 605558          | 40 J                  | 12400             | 12500      | 99    | 80-120        | 09/06/18 16:01 |
|               | Sulfur    | 6010C  | 605558          | 10 J                  | 4690              | 5000       | 94    | 80-120        | 09/06/18 16:01 |
| K1807597-008A | Aluminum  | 6010C  | 605558          | 4 U                   | 5150              | 5000       | 103   | 80-120        | 09/06/18 14:05 |
|               | Calcium   | 6010C  | 605558          | 5 J                   | 12600             | 12500      | 101   | 80-120        | 09/06/18 14:05 |
|               | Iron      | 6010C  | 605558          | 4 J ✓                 | 2480 ✓            | 2500       | 99 ✓  | 80-120        | 09/06/18 14:05 |
|               | Magnesium | 6010C  | 605558          | 0.7 J                 | 12500             | 12500      | 100   | 80-120        | 09/06/18 14:05 |
|               | Potassium | 6010C  | 605558          | 60 U                  | 12600             | 12500      | 101   | 80-120        | 09/06/18 14:05 |
|               | Sodium    | 6010C  | 605558          | 20 U                  | 12500             | 12500      | 100   | 80-120        | 09/06/18 14:05 |

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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

POST SPIKE SAMPLE RECOVERY

Concentration Units: ug/L

| Sample ID     | Analyte   | Method | Analysis Batch: | Initial Sample Result | Post Spike Result | True Value | % Rec | % Rec. Limits | Analysis Date  |
|---------------|-----------|--------|-----------------|-----------------------|-------------------|------------|-------|---------------|----------------|
| K1807597-008A | Sulfur    | 6010C  | 605558          | 6 U                   | 4680 ✓            | 5000       | 94 ✓  | 80-120        | 09/06/18 14:05 |
| K1807597-004A | Antimony  | 6020A  | 605777          | 0.020 U               | 18.3              | 20.0       | 91    | 80-120        | 09/07/18 16:46 |
|               | Arsenic   | 6020A  | 605777          | 0.08 U                | 18.4              | 20.0       | 92    | 80-120        | 09/07/18 16:46 |
|               | Barium    | 6020A  | 605777          | 0.021 J               | 18.5              | 20.0       | 93    | 80-120        | 09/07/18 16:46 |
|               | Beryllium | 6020A  | 605777          | 0.002 U               | 18.8              | 20.0       | 94    | 80-120        | 09/07/18 16:46 |
|               | Cadmium   | 6020A  | 605777          | 0.009 U               | 18.5              | 20.0       | 92    | 80-120        | 09/07/18 16:46 |
|               | Chromium  | 6020A  | 605777          | 0.03 J ✓              | 18.6              | 20.0       | 93    | 80-120        | 09/07/18 16:46 |
|               | Cobalt    | 6020A  | 605777          | 0.005 U               | 18.9              | 20.0       | 95    | 80-120        | 09/07/18 16:46 |
|               | Copper    | 6020A  | 605777          | 0.02 U                | 18.8 ✓            | 20.0       | 94 ✓  | 80-120        | 09/07/18 16:46 |
|               | Lead      | 6020A  | 605777          | 0.007 U               | 18.6              | 20.0       | 93    | 80-120        | 09/07/18 16:46 |
|               | Manganese | 6020A  | 605777          | 0.02 J                | 19.0              | 20.0       | 95    | 80-120        | 09/07/18 16:46 |
|               | Nickel    | 6020A  | 605777          | 0.04 U                | 18.7              | 20.0       | 93    | 80-120        | 09/07/18 16:46 |
|               | Silver    | 6020A  | 605777          | 0.002 U               | 9.76              | 10.0       | 98    | 80-120        | 09/07/18 16:46 |
|               | Thallium  | 6020A  | 605777          | 0.008 U               | 18.7              | 20.0       | 93    | 80-120        | 09/07/18 16:46 |
|               | Uranium   | 6020A  | 605777          | 0.005 U               | 18.5              | 20.0       | 93    | 80-120        | 09/07/18 16:46 |
|               | Vanadium  | 6020A  | 605777          | 0.04 U                | 18.6              | 20.0       | 93    | 80-120        | 09/07/18 16:46 |
|               | Zinc      | 6020A  | 605777          | 4.6                   | 21.6 ✓            | 20.0       | 85 ✓  | 80-120        | 09/07/18 16:46 |
| K1807597-020A | Selenium  | 7742   | 609410          | 0.2 U                 | 2.6 ✓             | 2.5        | 102 ✓ | 80-120        | 10/03/18 11:44 |

Results flagged with a pound (#) indicate the control criteria is not applicable.

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QA/QC Report

**Client:** Teck American Incorporated  
**Project** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** 08/14/18  
**Date Received:** 08/15/18  
**Date Analyzed:** 09/06/18

**Replicate Sample Summary**  
**Total Metals**

**Sample Name:** Rinsate Blank-Northern Pike 8/14  
**Lab Code:** K1807597-002 ✓

**Units:** ug/L  
**Basis:** NA

| Analyte Name | Analysis Method | MRL | MDL | Sample Result ✓ | Duplicate Sample    | Average | RPD  | RPD Limit |
|--------------|-----------------|-----|-----|-----------------|---------------------|---------|------|-----------|
|              |                 |     |     |                 | KQ1811403-03 Result |         |      |           |
| Aluminum     | 6010C           | 11  | 4   | ND U            | ND U                | ND      | -    | 20 ✓      |
| Calcium      | 6010C           | 21  | 0.9 | 11 J            | 10 J ✓              | 11      | 10 ✓ | 20        |
| Iron         | 6010C           | 21  | 3   | 7 J             | 8 J ✓               | 8       | 13   | 20        |
| Magnesium    | 6010C           | 5.3 | 0.3 | 2.7 J           | 2.6 J ✓             | 2.7     | 4    | 20        |
| Potassium    | 6010C           | 210 | 60  | ND U            | ND U                | ND      | -    | 20        |
| Sodium       | 6010C           | 210 | 20  | 40 J            | 50 J ✓              | 50      | 22 # | 20        |
| Sulfur       | 6010C           | 170 | 6   | 10 J            | 10 J ✓              | 10      | <1   | 20        |

Na Δ < RL  
no qual

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ALS Group USA, Corp.  
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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** 08/17/18  
**Date Received:** 08/21/18  
**Date Analyzed:** 09/06/18

Replicate Sample Summary  
Total Metals

**Sample Name:** Rinsate Blank-Northern Pike 8/17  
**Lab Code:** K1807597-008 ✓

**Units:** ug/L  
**Basis:** NA

| Analyte Name | Analysis Method | MRL | MDL | Sample Result | Duplicate Sample<br>KQ1811637-03 | Average | RPD  | RPD Limit |
|--------------|-----------------|-----|-----|---------------|----------------------------------|---------|------|-----------|
|              |                 |     |     |               | Result                           |         |      |           |
| Aluminum     | 6010C           | 11  | 4   | ND U ✓        | ND U                             | ND      | 40 # | 20 ✓      |
| Calcium      | 6010C           | 21  | 0.9 | 6 J           | 4 J ✓                            | 5       | 40 # | 20        |
| Iron         | 6010C           | 21  | 3   | 4 J           | 6 J ✓                            | 5       | 40 # | 20        |
| Magnesium    | 6010C           | 5.3 | 0.3 | 0.7 J         | 0.5 J ✓                          | 0.6     | 33 # | 20        |
| Potassium    | 6010C           | 210 | 60  | ND U          | ND U                             | ND      | -    | 20        |
| Sodium       | 6010C           | 210 | 20  | ND U          | ND U                             | ND      | -    | 20        |
| Sulfur       | 6010C           | 170 | 6   | ND U          | ND U                             | ND      | -    | 20        |

Ca, Fe, Mg > < RL  
no qual

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** 08/17/18  
**Date Received:** 08/21/18  
**Date Analyzed:** 08/30/18

Replicate Sample Summary  
Total Metals

**Sample Name:** Homogenization Blank-Northern Pike 8/17  
**Lab Code:** K1807597-009 ✓

**Units:** ug/L  
**Basis:** NA

| Analyte Name | Analysis Method | MRL   | MDL   | Sample Result | Duplicate Sample<br>KQ1811638-03 | Average | RPD   | RPD Limit |
|--------------|-----------------|-------|-------|---------------|----------------------------------|---------|-------|-----------|
|              |                 |       |       |               | Result                           |         |       |           |
| Antimony     | 6020A           | 0.050 | 0.020 | ND U          | ND U                             | ND      | -     | 20 ✓      |
| Arsenic      | 6020A           | 0.50  | 0.08  | ND U          | ND U                             | ND      | -     | 20        |
| Barium       | 6020A           | 0.050 | 0.020 | ND U          | ND U                             | ND      | -     | 20        |
| Beryllium    | 6020A           | 0.020 | 0.002 | ND U          | ND U                             | ND      | -     | 20        |
| Cadmium      | 6020A           | 0.020 | 0.009 | ND U          | ND U                             | ND      | -     | 20        |
| Chromium     | 6020A           | 0.20  | 0.03  | ND U          | ND U                             | ND      | -     | 20        |
| Cobalt       | 6020A           | 0.020 | 0.005 | ND U          | ND U                             | ND      | -     | 20        |
| Copper       | 6020A           | 0.10  | 0.02  | 0.11          | 0.12 ✓                           | 0.12    | 9 ✓   | 20        |
| Lead         | 6020A           | 0.020 | 0.007 | ND U          | ND U                             | ND      | -     | 20        |
| Manganese    | 6020A           | 0.20  | 0.006 | 0.07 J        | 0.02 J ✓                         | 0.05    | 111 # | 20        |
| Nickel       | 6020A           | 0.20  | 0.04  | ND U          | ND U                             | ND      | -     | 20        |
| Silver       | 6020A           | 0.020 | 0.002 | ND U          | ND U                             | ND      | -     | 20        |
| Thallium     | 6020A           | 0.020 | 0.008 | ND U          | ND U                             | ND      | -     | 20        |
| Uranium      | 6020A           | 0.020 | 0.005 | ND U          | ND U                             | ND      | -     | 20        |
| Vanadium     | 6020A           | 0.20  | 0.04  | ND U          | ND U                             | ND      | -     | 20        |
| Zinc         | 6020A           | 2.0   | 0.08  | 3.1           | 3.4 ✓                            | 3.3     | 9     | 20        |

MA Δ < RL  
no qual

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dba ALS Environmental

QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** 08/14/18  
**Date Received:** 08/15/18  
**Date Analyzed:** 09/07/18

Replicate Sample Summary  
Total Metals

**Sample Name:** Homogenization Blank-Northern Pike 8/14  
**Lab Code:** K1807597-004 ✓

**Units:** ug/L  
**Basis:** NA

| Analyte Name | Analysis Method | MRL   | MDL   | Sample Result | Duplicate Sample | Average | RPD   | RPD Limit |
|--------------|-----------------|-------|-------|---------------|------------------|---------|-------|-----------|
|              |                 |       |       |               | KQ1812163-03     |         |       |           |
| Antimony     | 6020A           | 0.050 | 0.020 | ND U          | ND U             | ND      | -     | 20 ✓      |
| Arsenic      | 6020A           | 0.50  | 0.08  | ND U          | ND U             | ND      | -     | 20        |
| Barium       | 6020A           | 0.050 | 0.020 | 0.021 J       | ND U             | NC      | NC    | 20        |
| Beryllium    | 6020A           | 0.020 | 0.002 | ND U          | ND U             | ND      | -     | 20        |
| Cadmium      | 6020A           | 0.020 | 0.009 | ND U          | ND U             | ND      | -     | 20        |
| Chromium     | 6020A           | 0.20  | 0.03  | 0.03 J        | ND U             | NC      | NC    | 20        |
| Cobalt       | 6020A           | 0.020 | 0.005 | ND U          | ND U             | ND      | -     | 20        |
| Copper       | 6020A           | 0.10  | 0.02  | ND U          | 0.04 J ✓         | NC      | NC    | 20        |
| Lead         | 6020A           | 0.020 | 0.007 | ND U          | ND U             | ND      | -     | 20        |
| Manganese    | 6020A           | 0.20  | 0.006 | 0.02 J        | 0.07 J ✓         | 0.05    | 111 # | 20        |
| Nickel       | 6020A           | 0.20  | 0.04  | ND U          | ND U             | ND      | -     | 20        |
| Silver       | 6020A           | 0.020 | 0.002 | ND U          | ND U             | ND      | -     | 20        |
| Thallium     | 6020A           | 0.020 | 0.008 | ND U          | ND U             | ND      | -     | 20        |
| Uranium      | 6020A           | 0.020 | 0.005 | ND U          | ND U             | ND      | -     | 20        |
| Vanadium     | 6020A           | 0.20  | 0.04  | ND U          | ND U             | ND      | -     | 20        |
| Zinc         | 6020A           | 2.0   | 0.08  | 4.6           | 4.8 ✓            | 4.7     | 4 ✓   | 20        |

Mn D < RL  
no qual

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

**Client:** Teck American Incorporated  
**Project** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** 08/17/18  
**Date Received:** 08/21/18  
**Date Analyzed:** 08/28/18

Replicate Sample Summary  
Total Metals

**Sample Name:** Homogenization Blank-Northern Pike 8/17  
**Lab Code:** K1807597-010 ✓

**Units:** ug/L  
**Basis:** NA

| Analyte Name | Analysis Method | MRL | MDL | Sample Result | Duplicate Sample       | Average | RPD | RPD Limit |
|--------------|-----------------|-----|-----|---------------|------------------------|---------|-----|-----------|
|              |                 |     |     |               | KQ1811639-03<br>Result |         |     |           |
| Selenium     | 7742            | 1.0 | 0.2 | ND U          | ND U                   | ND      | -   | 20        |

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Analyzed:** 09/06/18

**Lab Control Sample Summary**  
**Total Metals**

**Units:**ug/L  
**Basis:**NA

**Lab Control Sample**  
KQ1811403-01 ✓

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec ✓ | % Rec Limits |
|--------------|-------------------|--------|--------------|---------|--------------|
| Aluminum     | 6010C             | 4940   | 5000         | 99      | 80-120 ✓     |
| Calcium      | 6010C             | 12100  | 12500        | 97      | 80-120       |
| Iron         | 6010C             | 2410 ✓ | 2500         | 96 ✓    | 80-120       |
| Magnesium    | 6010C             | 11900  | 12500        | 95      | 80-120       |
| Potassium    | 6010C             | 12000  | 12500        | 96      | 80-120       |
| Sodium       | 6010C             | 11900  | 12500        | 95      | 80-120       |
| Sulfur       | 6010C             | 9290 ✓ | 10000        | 93 ✓    | 80-120       |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Analyzed:** 09/06/18

**Lab Control Sample Summary**  
**Total Metals**

**Units:**ug/L  
**Basis:**NA

**Lab Control Sample**  
KQ1811637-01 ✓

| Analyte Name | Analytical Method | Result  | Spike Amount | % Rec ✓ | % Rec Limits |
|--------------|-------------------|---------|--------------|---------|--------------|
| Aluminum     | 6010C             | 5010    | 5000         | 100     | 80-120 ✓     |
| Calcium      | 6010C             | 12400 ✓ | 12500        | 99 ✓    | 80-120       |
| Iron         | 6010C             | 2440    | 2500         | 97      | 80-120       |
| Magnesium    | 6010C             | 12200   | 12500        | 98      | 80-120       |
| Potassium    | 6010C             | 12400   | 12500        | 99      | 80-120       |
| Sodium       | 6010C             | 12200 ✓ | 12500        | 97 ✓    | 80-120       |
| Sulfur       | 6010C             | 9210    | 10000        | 92      | 80-120       |



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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Analyzed:** 10/03/18

**Duplicate Lab Control Sample Summary**  
**Total Metals**

**Units:**ug/L  
**Basis:**NA

| Analyte Name | Analytical Method | Result  | Lab Control Sample<br>KQ1813871-01 ✓ |       | Duplicate Lab Control Sample<br>KQ1813871-02 ✓ |              |       |              | RPD | RPD Limit |
|--------------|-------------------|---------|--------------------------------------|-------|------------------------------------------------|--------------|-------|--------------|-----|-----------|
|              |                   |         | Spike Amount                         | % Rec | Result                                         | Spike Amount | % Rec | % Rec Limits |     |           |
| Aluminum     | 6010C             | 4960    | 5000                                 | 99    | 5000                                           | 5000         | 100   | 80-120 ✓     | <1  | 30        |
| Calcium      | 6010C             | 11500 ✓ | 12500                                | 92 ✓  | 11600                                          | 12500        | 93    | 80-120       | <1  | 30        |
| Iron         | 6010C             | 2290    | 2500                                 | 91    | 2300                                           | 2500         | 92    | 80-120       | <1  | 30        |
| Magnesium    | 6010C             | 11700   | 12500                                | 94    | 11900                                          | 12500        | 95    | 80-120       | 2   | 30        |
| Potassium    | 6010C             | 11800   | 12500                                | 94    | 12200 ✓                                        | 12500        | 97 ✓  | 80-120       | 3   | 30        |
| Sodium       | 6010C             | 11800   | 12500                                | 95    | 12100                                          | 12500        | 97    | 80-120       | 3   | 30        |
| Sulfur       | 6010C             | 9280    | 10000                                | 93    | 9170                                           | 10000        | 92    | 80-120       | 1   | 30        |

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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks  
Sample Matrix: Water

Service Request: K1807597  
Date Analyzed: 08/30/18

Lab Control Sample Summary  
Total Metals

Units:ug/L  
Basis:NA

Lab Control Sample  
KQ1811638-02 ✓

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|--------------|-------------------|--------|--------------|-------|--------------|
| Antimony     | 6020A             | 10.9   | 10.0         | 109   | 80-120 ✓     |
| Arsenic      | 6020A             | 49.7   | 50.0         | 99    | 80-120       |
| Barium       | 6020A             | 107 ✓  | 100          | 107 ✓ | 80-120       |
| Beryllium    | 6020A             | 2.79   | 2.50         | 112   | 80-120       |
| Cadmium      | 6020A             | 25.3   | 25.0         | 101   | 80-120       |
| Chromium     | 6020A             | 10.6   | 10.0         | 106   | 80-120       |
| Cobalt       | 6020A             | 26.7   | 25.0         | 107   | 80-120       |
| Copper       | 6020A             | 13.0   | 12.5         | 104   | 80-120       |
| Lead         | 6020A             | 50.4   | 50.0         | 101   | 80-120       |
| Manganese    | 6020A             | 25.9   | 25.0         | 104   | 80-120       |
| Nickel       | 6020A             | 26.3 ✓ | 25.0         | 105 ✓ | 80-120       |
| Selenium     | 6020A             | 50.5   | 50.0         | 101   | 80-120       |
| Silver       | 6020A             | 12.9   | 12.5         | 103   | 80-120       |
| Thallium     | 6020A             | 49.1   | 50.0         | 98    | 80-120       |
| Uranium      | 6020A             | 20.9   | 20.0         | 105   | 80-120       |
| Vanadium     | 6020A             | 26.8   | 25.0         | 107   | 80-120       |
| Zinc         | 6020A             | 25.1   | 25.0         | 101   | 80-120       |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Analyzed:** 09/07/18

**Lab Control Sample Summary**  
**Total Metals**

**Units:**ug/L  
**Basis:**NA

**Lab Control Sample**  
KQ1812163-02 ✓

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|--------------|-------------------|--------|--------------|-------|--------------|
| Antimony     | 6020A             | 9.94   | 10.0         | 99    | 80-120 ✓     |
| Arsenic      | 6020A             | 50.2   | 50.0         | 100   | 80-120       |
| Barium       | 6020A             | 101    | 100          | 101   | 80-120       |
| Beryllium    | 6020A             | 2.72   | 2.50         | 109   | 80-120       |
| Cadmium      | 6020A             | 25.3   | 25.0         | 101   | 80-120       |
| Chromium     | 6020A             | 9.92   | 10.0         | 99    | 80-120       |
| Cobalt       | 6020A             | 25.1 ✓ | 25.0         | 100 ✓ | 80-120       |
| Copper       | 6020A             | 12.7   | 12.5         | 102   | 80-120       |
| Lead         | 6020A             | 50.0   | 50.0         | 100   | 80-120       |
| Manganese    | 6020A             | 25.6   | 25.0         | 102   | 80-120       |
| Nickel       | 6020A             | 25.3   | 25.0         | 101   | 80-120       |
| Selenium     | 6020A             | 52.5   | 50.0         | 105   | 80-120       |
| Silver       | 6020A             | 12.6   | 12.5         | 101   | 80-120       |
| Thallium     | 6020A             | 49.6   | 50.0         | 99    | 80-120       |
| Uranium      | 6020A             | 20.8 ✓ | 20.0         | 104 ✓ | 80-120       |
| Vanadium     | 6020A             | 25.0   | 25.0         | 100   | 80-120       |
| Zinc         | 6020A             | 23.8   | 25.0         | 95    | 80-120       |

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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks  
Sample Matrix: Water

Service Request: K1807597  
Date Analyzed: 10/03/18

Duplicate Lab Control Sample Summary  
Total Metals

Units:ug/L  
Basis:NA

| Lab Control Sample |                   |        |              |       | Duplicate Lab Control Sample |              |       |              |     |           |
|--------------------|-------------------|--------|--------------|-------|------------------------------|--------------|-------|--------------|-----|-----------|
| KQ1813873-02 ✓     |                   |        |              |       | KQ1813873-03 ✓               |              |       |              |     |           |
| Analyte Name       | Analytical Method | Result | Spike Amount | % Rec | Result                       | Spike Amount | % Rec | % Rec Limits | RPD | RPD Limit |
| Antimony           | 6020A             | 9.05   | 10.0         | 90    | 9.44                         | 10.0         | 94    | 80-120 ✓     | 4   | 20        |
| Arsenic            | 6020A             | 45.6   | 50.0         | 91    | 47.0                         | 50.0         | 94    | 80-120       | 3   | 20        |
| Barium             | 6020A             | 92.8 ✓ | 100          | 93 ✓  | 97.9                         | 100          | 98    | 80-120       | 5   | 20        |
| Beryllium          | 6020A             | 2.38   | 2.50         | 95    | 2.46                         | 2.50         | 98    | 80-120       | 3   | 20        |
| Cadmium            | 6020A             | 23.3   | 25.0         | 93    | 23.7                         | 25.0         | 95    | 80-120       | 2   | 20        |
| Chromium           | 6020A             | 8.98   | 10.0         | 90    | 9.53                         | 10.0         | 95    | 80-120       | 6   | 20        |
| Cobalt             | 6020A             | 22.6   | 25.0         | 90    | 24.0 ✓                       | 25.0         | 96 ✓  | 80-120       | 6   | 20        |
| Copper             | 6020A             | 11.1   | 12.5         | 89    | 11.9                         | 12.5         | 95    | 80-120       | 7   | 20        |
| Lead               | 6020A             | 45.7   | 50.0         | 91    | 47.4                         | 50.0         | 95    | 80-120       | 4   | 20        |
| Manganese          | 6020A             | 23.0   | 25.0         | 92    | 23.4                         | 25.0         | 94    | 80-120       | 2   | 20        |
| Nickel             | 6020A             | 22.5 ✓ | 25.0         | 90 ✓  | 24.0                         | 25.0         | 96    | 80-120       | 6   | 20        |
| Silver             | 6020A             | 11.8   | 12.5         | 94    | 12.2                         | 12.5         | 97    | 80-120       | 3   | 20        |
| Thallium           | 6020A             | 45.4   | 50.0         | 91    | 46.8                         | 50.0         | 94    | 80-120       | 3   | 20        |
| Uranium            | 6020A             | 17.6   | 20.0         | 88    | 21.4                         | 20.0         | 107   | 80-120       | 24* | 20        |
| Vanadium           | 6020A             | 21.6   | 25.0         | 87    | 22.9 ✓                       | 25.0         | 92 ✓  | 80-120       | 6   | 20        |
| Zinc               | 6020A             | 21.9   | 25.0         | 88    | 23.7                         | 25.0         | 95    | 80-120       | 8   | 20        |

no (+)

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Analyzed:** 08/28/18

**Lab Control Sample Summary**  
**Total Metals**

**Units:**ug/L  
**Basis:**NA

**Lab Control Sample**  
KQ1811402-02 ✓

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|--------------|-------------------|--------|--------------|-------|--------------|
| Selenium     | 7742              | 10.1 ✓ | 10.0         | 101 ✓ | 80-120       |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Analyzed:** 08/28/18

**Lab Control Sample Summary**  
**Total Metals**

**Units:**ug/L  
**Basis:**NA

**Lab Control Sample**  
KQ1811639-02 ✓

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | % Rec Limits |
|--------------|-------------------|--------|--------------|-------|--------------|
| Selenium     | 7742              | 10.0 ✓ | 10.0         | 100 ✓ | 80-120       |

ALS Group USA, Corp.  
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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Analyzed:** 10/03/18

**Duplicate Lab Control Sample Summary**  
**Total Metals**

**Units:**ug/L  
**Basis:**NA

**Lab Control Sample**      **Duplicate Lab Control Sample**  
KQ1813872-02 ✓      KQ1813872-03 ✓

| Analyte Name | Analytical Method | Result | Spike Amount | % Rec | Result | Spike Amount | % Rec | % Rec Limits | RPD | RPD Limit |
|--------------|-------------------|--------|--------------|-------|--------|--------------|-------|--------------|-----|-----------|
| Selenium     | 7742              | 9.0 ✓  | 10.0         | 90 ✓  | 9.1 ✓  | 10.0         | 91 ✓  | 80-120       | 1 ✓ | 20        |

ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

ICP SERIAL DILUTIONS

Concentration Units: ug/L

| Sample ID       | Analyte   | Method | Analysis Batch: | Initial Sample Result | Serial Dillution Result | % Diff | % Diff. Limit | Analysis Date  |
|-----------------|-----------|--------|-----------------|-----------------------|-------------------------|--------|---------------|----------------|
| K1807597-002SDL |           |        |                 |                       |                         |        |               |                |
|                 | Aluminum  | 6010C  | 605558          | 4 U                   | 5 U                     | 163    | 10            | 09/06/18 15:54 |
|                 | Calcium   | 6010C  | 605558          | 10 J                  | 20 J                    | 59     | 10            | 09/06/18 15:54 |
|                 | Iron      | 6010C  | 605558          | 6 J                   | 30 J                    | 384    | 10            | 09/06/18 15:54 |
|                 | Magnesium | 6010C  | 605558          | 3 J ✓                 | 4 J                     | 35     | 10            | 09/06/18 15:54 |
|                 | Potassium | 6010C  | 605558          | 60 U                  | -87.5 U                 | -7192  | 10            | 09/06/18 15:54 |
|                 | Sodium    | 6010C  | 605558          | 40 J                  | 30 U                    | 19     | 10            | 09/06/18 15:54 |
|                 | Sulfur    | 6010C  | 605558          | 10 J                  | -161 J                  | 1643   | 10            | 09/06/18 15:54 |
| K1807597-008SDL |           |        |                 |                       |                         |        |               |                |
|                 | Aluminum  | 6010C  | 605558          | 4 U                   | 5 U                     | 178    | 10            | 09/06/18 13:50 |
|                 | Calcium   | 6010C  | 605558          | 5 J                   | 10 J                    | 136    | 10            | 09/06/18 13:50 |
|                 | Iron      | 6010C  | 605558          | 4 J                   | 10 U                    | 265    | 10            | 09/06/18 13:50 |
|                 | Magnesium | 6010C  | 605558          | 0.7 J ✓               | 2 J                     | 186    | 10            | 09/06/18 13:50 |
|                 | Potassium | 6010C  | 605558          | 60 U                  | 8 U                     | -126   | 10            | 09/06/18 13:50 |
|                 | Sodium    | 6010C  | 605558          | 20 U                  | 40 U                    | 283    | 10            | 09/06/18 13:50 |
|                 | Sulfur    | 6010C  | 605558          | 6 U                   | -181 J                  | -439   | 10            | 09/06/18 13:50 |
| K1807597-004SDL |           |        |                 |                       |                         |        |               |                |
|                 | Antimony  | 6020A  | 605777          | 0.02 U                | -0.0162 U               | 616    | 10            | 09/07/18 16:42 |
|                 | Arsenic   | 6020A  | 605777          | 0.08 U                | 0.02 U                  | 89     | 10            | 09/07/18 16:42 |
|                 | Barium    | 6020A  | 605777          | 0.02 J                | 0.02 U                  | 4      | 10            | 09/07/18 16:42 |
|                 | Beryllium | 6020A  | 605777          | 0.002 U               | -0.00585 U              | 1685   | 10            | 09/07/18 16:42 |
|                 | Cadmium   | 6020A  | 605777          | 0.009 U               | 0.008 U                 | 426    | 10            | 09/07/18 16:42 |
|                 | Chromium  | 6020A  | 605777          | 0.03 J                | 0.04 U                  | 14     | 10            | 09/07/18 16:42 |
|                 | Cobalt    | 6020A  | 605777          | 0.005 U ✓             | -0.00989 U              | 1898   | 10            | 09/07/18 16:42 |
|                 | Copper    | 6020A  | 605777          | 0.02 U                | 0.02 U                  | 21     | 10            | 09/07/18 16:42 |
|                 | Lead      | 6020A  | 605777          | 0.007 U               | 0.002 U                 | 48     | 10            | 09/07/18 16:42 |
|                 | Manganese | 6020A  | 605777          | 0.02 J                | 0.03 J                  | 83     | 10            | 09/07/18 16:42 |
|                 | Nickel    | 6020A  | 605777          | 0.04 U                | 0.007 U                 | 64     | 10            | 09/07/18 16:42 |
|                 | Silver    | 6020A  | 605777          | 0.002 U               | -0.00426 U              | -974   | 10            | 09/07/18 16:42 |
|                 | Thallium  | 6020A  | 605777          | 0.008 U               | -0.00862 U              | 11749  | 10            | 09/07/18 16:42 |
|                 | Uranium   | 6020A  | 605777          | 0.005 U               | -0.00587 U              | -397   | 10            | 09/07/18 16:42 |
|                 | Vanadium  | 6020A  | 605777          | 0.04 U                | 0.08 U                  | -92624 | 10            | 09/07/18 16:42 |
|                 | Zinc      | 6020A  | 605777          | 5                     | 5 J ✓                   | 6 ✓    | 10            | 09/07/18 16:42 |

↳ all exc. Zn < 50x DL, no qual



# LABWORKS - Summary Report

Sample ID: K1807597-009L  
 Sample Date/Time: Thursday, August 30, 2018 16:07:19 ✓  
 Sample Description: 5X ✓  
 Autosampler Position: 333  
 Number of Replicates: 3  
 Dataset File: C:\NexIONData\DataSet\083018A\K1807597-009L.050  
 User Name: RRM  
 Batch ID:

all -009  
 init results < 50+ DL  
 no qual

## Concentration Results

| Analyte    | Mass | Meas. Intens. Mean | Meas. Intens. RSD | Conc. Mean | Conc. RSD | Sample Unit |
|------------|------|--------------------|-------------------|------------|-----------|-------------|
| [> Li-STD  | 6    | 1601751.8          | 3.6               |            |           | ppb         |
| Be-STD1    | 9    | 42.0               | 12.6              | 0.00060    | 112.2     | ppb         |
| B-STD1     | 10   | 670.0              | 2.8               | 0.17041    | 5.4       | ppb         |
| B-STD1     | 11   | 2688.9             | 0.2               | 0.16998    | 6.9       | ppb         |
| [ Mn-STD1  | 55   | 1874.8             | 4.4               | -0.00391 ✓ | 54.4      | ppb         |
| [> Ge-STD  | 72   | 1541657.6          | 2.9               |            |           | ppb         |
| [ Al-KED2  | 27   | 281.0              | 8.4               | 0.62383    | 8.3       | ppb         |
| [> Sc-KED2 | 45   | 63010.0            | 1.2               |            |           | ppb         |
| [ V-KED3   | 51   | 61.3               | 9.4               | 0.00746    | 132.7     | ppb         |
| Cr-KED3    | 52   | 56.3               | 10.7              | 0.01352    | 59.1      | ppb         |
| Cr-KED3    | 53   | 29.3               | 37.6              | -0.02621   | 434.8     | ppb         |
| Fe-KED3    | 56   | 492.0              | 1.5               | -0.02943   | 66.3      | ppb         |
| Co-KED3    | 59   | 5.0                | 34.6              | -0.00121   | 81.8      | ppb         |
| Ni-KED3    | 60   | 13.3               | 15.6              | -0.04445   | 8.3       | ppb         |
| Ni-KED3    | 62   | 5.3                | 21.7              | -0.06723   | 19.9      | ppb         |
| Cu-KED3    | 63   | 51.3               | 29.8              | 0.02157 ✓  | 40.5      | ppb         |
| Cu-KED3    | 65   | 32.0               | 8.3               | 0.02608    | 10.2      | ppb         |
| Zn-KED3    | 66   | 126.7              | 0.9               | 0.57065 ✓  | 0.4       | ppb         |
| [> Ge-KED3 | 72   | 47497.2            | 1.0               |            |           | ppb         |
| [> Ge-KED2 | 72   | 195333.5           | 1.4               |            |           | ppb         |
| As-KED2    | 75   | 51.7               | 5.9               | -0.01132   | 87.8      | ppb         |
| Sr-KED2    | 88   | 90.7               | 5.6               | 0.00669    | 19.6      | ppb         |
| [> Ge-KED1 | 72   | 623349.3           | 3.0               |            |           | ppb         |
| Se-KED1    | 77   | 526.7              | 1.5               | 0.29162    | 67.3      | ppb         |
| Se-KED1    | 78   | 12.4               | 39.9              | 0.00327    | 469.0     | ppb         |
| [ Mo-KED2  | 95   | 14.7               | 20.8              | -0.00277   | 70.0      | ppb         |
| Mo-KED2    | 98   | 25.9               | 15.9              | 0.00010    | 1429.4    | ppb         |
| [> Rh-KED2 | 103  | 285439.0           | 1.1               |            |           | ppb         |
| Ag-KED2    | 107  | 17.0               | 20.4              | -0.00059   | 92.2      | ppb         |
| Ag-KED2    | 109  | 11.7               | 26.2              | -0.00027   | 197.2     | ppb         |
| Cd-KED2    | 111  | 4.7                | 61.9              | -0.00100   | 325.6     | ppb         |
| Cd-KED2    | 114  | 7.7                | 42.1              | -0.00099   | 160.6     | ppb         |
| Sn-KED2    | 118  | 61.7               | 13.6              | -0.00847   | 63.1      | ppb         |
| Sb-KED2    | 121  | 10.7               | 28.6              | -0.00291   | 73.4      | ppb         |
| Sb-KED2    | 123  | 9.9                | 36.1              | 0.00191    | 174.8     | ppb         |
| Ba-KED2    | 137  | 10.0               | 20.0              | 0.00560    | 46.6      | ppb         |
| [> Lu-KED2 | 175  | 139205.7           | 1.2               |            |           | ppb         |
| Tl-KED2    | 203  | 10.0               | 72.1              | -0.00130   | 132.5     | ppb         |
| Tl-KED2    | 205  | 29.0               | 19.2              | -0.00016   | 326.5     | ppb         |
| Pb-KED2    | 208  | 80.7               | 4.7               | 0.00229    | 14.8      | ppb         |
| Bi-KED2    | 209  | 65.3               | 15.1              | -0.00776   | 13.8      | ppb         |
| [> Th-KED2 | 232  | 364028.5           | 0.6               |            |           | ppb         |
| U-KED2     | 238  | 15.3               | 32.8              | -0.00105   | 43.8      | ppb         |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks

**Service Request:** K1807597

**Detection Limits**

**Instrument:** K-JCP-AES-03

**Matrix:** Water

| Analyte   | Wavelength<br>(nm) | Units | MRL | MDL | Method |
|-----------|--------------------|-------|-----|-----|--------|
| Aluminum  | 1670               | ug/L  | 10  | 4   | 6010C  |
| Calcium   | 3933               | ug/L  | 20  | 0.9 | 6010C  |
| Iron      | 2599               | ug/L  | 20  | 3   | 6010C  |
| Magnesium | 2795               | ug/L  | 5   | 0.3 | 6010C  |
| Potassium | 7664               | ug/L  | 200 | 60  | 6010C  |
| Sodium    | 5895               | ug/L  | 200 | 20  | 6010C  |
| Sulfur    | 1820               | ug/L  | 160 | 6   | 6010C  |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks

**Service Request:** K1807597

**Detection Limits**

**Instrument:** K-ICP-MS-04

**Matrix:** Water

| Analyte   | Mass | Units | MRL  | MDL   | Method |
|-----------|------|-------|------|-------|--------|
| Antimony  | 123  | ug/L  | 0.05 | 0.02  | 6020A  |
| Arsenic   | 75   | ug/L  | 0.5  | 0.08  | 6020A  |
| Barium    | 137  | ug/L  | 0.05 | 0.02  | 6020A  |
| Beryllium | 9    | ug/L  | 0.02 | 0.002 | 6020A  |
| Cadmium   | 111  | ug/L  | 0.02 | 0.009 | 6020A  |
| Chromium  | 52   | ug/L  | 0.2  | 0.03  | 6020A  |
| Cobalt    | 59   | ug/L  | 0.02 | 0.005 | 6020A  |
| Copper    | 65   | ug/L  | 0.1  | 0.02  | 6020A  |
| Lead      | 208  | ug/L  | 0.02 | 0.007 | 6020A  |
| Manganese | 55   | ug/L  | 0.2  | 0.006 | 6020A  |
| Nickel    | 60   | ug/L  | 0.2  | 0.04  | 6020A  |
| Silver    | 107  | ug/L  | 0.02 | 0.002 | 6020A  |
| Thallium  | 205  | ug/L  | 0.02 | 0.008 | 6020A  |
| Uranium   | 238  | ug/L  | 0.02 | 0.005 | 6020A  |
| Vanadium  | 51   | ug/L  | 0.2  | 0.04  | 6020A  |
| Zinc      | 66   | ug/L  | 2.0  | 0.08  | 6020A  |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks

**Service Request:** K1807597

**Detection Limits**

**Instrument:** K-FLAA-02

**Matrix:** Water

| Analyte  | Wavelength<br>(nm) | Units | MRL | MDL | Method |
|----------|--------------------|-------|-----|-----|--------|
| Selenium | 196.0              | ug/L  | 0.5 | 0.1 | 7742   |

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QA/QC Report

**Client:** Teck American Incorporated**Service Request:** K1807597**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks**ICP Linear Range (Quarterly)****Instrument:** K-ICP-MS-04

| <b>Analyte</b> | <b>Concentration (ug/L)</b> | <b>Method</b> |
|----------------|-----------------------------|---------------|
| Antimony 123   | 3000                        | 6020A         |
| Arsenic 75     | 3000                        | 6020A         |
| Barium 137     | 3000                        | 6020A         |
| Beryllium 9    | 900                         | 6020A         |
| Cadmium 111    | 3000                        | 6020A         |
| Chromium 52    | 3000                        | 6020A         |
| Cobalt 59      | 3000                        | 6020A         |
| Copper 65      | 3000                        | 6020A         |
| Lead 208       | 3000                        | 6020A         |
| Manganese 55   | 3000                        | 6020A         |
| Nickel 60      | 3000                        | 6020A         |
| Silver 107     | 900                         | 6020A         |
| Thallium 205   | 3000                        | 6020A         |
| Uranium 238    | 3000                        | 6020A         |
| Vanadium 51    | 3000                        | 6020A         |
| Zinc 66        | 3000                        | 6020A         |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks

**Service Request:** K1807597

**ICP Linear Range (Quarterly)**

**Instrument:** K-ICP-AES-03

| Analyte        | Concentration (ug/L) | Method |
|----------------|----------------------|--------|
| Aluminum 1670  | 2000                 | 6010C  |
| Aluminum 3944  | 270000               | 6010C  |
| Calcium 3158   | 900000               | 6010C  |
| Calcium 3933   | 8000                 | 6010C  |
| Iron 2599      | 360000               | 6010C  |
| Magnesium 2790 | 540000               | 6010C  |
| Magnesium 2795 | 8000                 | 6010C  |
| Magnesium 2852 | 90000                | 6010C  |
| Potassium 7664 | 900000               | 6010C  |
| Sodium 5895    | 900000               | 6010C  |
| Sulfur 1820    | 450000               | 6010C  |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks

**Service Request:** K1807597

**ICP Linear Range (Quarterly)**

**Instrument:** K-ICP-MS-05

| Analyte      | Concentration (ug/L) | Method |
|--------------|----------------------|--------|
| Antimony 121 | 3000                 | 6020A  |
| Arsenic 75   | 3000                 | 6020A  |
| Barium 138   | 3000                 | 6020A  |
| Beryllium 9  | 3000                 | 6020A  |
| Cadmium 111  | 3000                 | 6020A  |
| Chromium 52  | 3000                 | 6020A  |
| Cobalt 59    | 3000                 | 6020A  |
| Copper 65    | 3000                 | 6020A  |
| Lead 208     | 3000                 | 6020A  |
| Manganese 55 | 3000                 | 6020A  |
| Nickel 60    | 3000                 | 6020A  |
| Silver 107   | 225                  | 6020A  |
| Thallium 205 | 3000                 | 6020A  |
| Uranium 238  | 3000                 | 6020A  |
| Vanadium 51  | 3000                 | 6020A  |
| Zinc 66      | 3000                 | 6020A  |

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Prep Summary Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:**K1807597

**Metals**

**Prep Method:** EPA CLP-METALS ILM04.0  
**Analytical Method:** 6010C

**Extraction Lot:** 320198  
**Extraction Date:** 08/22/18 16:55 ✓

| Sample Name                   | Lab Code        | Date Collected | Date Received | Sample Amount ✓ | Final Amount ✓ | Percent Solids |
|-------------------------------|-----------------|----------------|---------------|-----------------|----------------|----------------|
| Rinsate Blank K1807185        | K1807597-002    | 8/14/18        | 8/15/18       | 10 mL           | 10.5 mL        |                |
| Homogenization Blank K1807185 | K1807597-003    | 8/14/18        | 8/15/18       | 10 mL           | 10.5 mL        |                |
| Homogenization Blank K1807185 | K1807597-004    | 8/14/18        | 8/15/18       | 10 mL           | 10.5 mL        |                |
| Rinsate Blank K1807185        | K1807597-005    | 8/15/18        | 8/15/18       | 10 mL           | 10.5 mL        |                |
| Homogenization Blank K1807185 | K1807597-006    | 8/15/18        | 8/15/18       | 10 mL           | 10.5 mL        |                |
| Homogenization Blank K1807185 | K1807597-007    | 8/15/18        | 8/15/18       | 10 mL           | 10.5 mL        |                |
| Lab Control Sample            | KQ1811403-01LCS | NA             | NA            | 10 mL           | 10.8 mL        |                |
| Method Blank                  | KQ1811403-02MB  | NA             | NA            | 10 mL           | 10.5 mL        |                |
| Duplicate                     | KQ1811403-03DUP | 8/14/18        | 8/15/18       | 10 mL           | 10.5 mL        |                |
| Matrix Spike                  | KQ1811403-04MS  | 8/14/18        | 8/15/18       | 10 mL           | 11 mL          |                |



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Prep Summary Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597

**Metals**

**Prep Method:** EPA CLP-METALS ILM04.0  
**Analytical Method:** 6010C

**Extraction Lot:** 320502  
**Extraction Date:** 08/27/18 16:29 ✓

| Sample Name                   | Lab Code        | Date Collected | Date Received | Sample Amount ✓ | Final Amount ✓ | Percent Solids |
|-------------------------------|-----------------|----------------|---------------|-----------------|----------------|----------------|
| Rinsate Blank K1807185        | K1807597-008    | 8/17/18        | 8/21/18       | 10 mL           | 10.5 mL        |                |
| Homogenization Blank K1807185 | K1807597-009    | 8/17/18        | 8/21/18       | 10 mL           | 10.5 mL        |                |
| Homogenization Blank K1807185 | K1807597-010    | 8/17/18        | 8/21/18       | 10 mL           | 10.5 mL        |                |
| Rinsate Blank K1807189        | K1807597-011    | 8/21/18        | 8/22/18       | 10 mL           | 10.5 mL        |                |
| Homogenization Blank K1807189 | K1807597-012    | 8/21/18        | 8/22/18       | 10 mL           | 10.5 mL        |                |
| Homogenization Blank K1807189 | K1807597-013    | 8/21/18        | 8/22/18       | 10 mL           | 10.5 mL        |                |
| Rinsate Blank K1807189        | K1807597-014    | 8/22/18        | 8/22/18       | 10 mL           | 10.5 mL        |                |
| Homogenization Blank K1807189 | K1807597-015    | 8/22/18        | 8/22/18       | 10 mL           | 10.5 mL        |                |
| Homogenization Blank K1807189 | K1807597-016    | 8/22/18        | 8/22/18       | 10 mL           | 10.5 mL        |                |
| Rinsate Blank K1807189        | K1807597-017    | 8/24/18        | 8/24/18       | 10 mL           | 10.5 mL        |                |
| Homogenization Blank K1807189 | K1807597-018    | 8/24/18        | 8/24/18       | 10 mL           | 10.5 mL        |                |
| Homogenization Blank K1807189 | K1807597-019    | 8/24/18        | 8/24/18       | 10 mL           | 10.5 mL        |                |
| Lab Control Sample            | KQ1811637-01LCS | NA             | NA            | 10 mL           | 10.8 mL        |                |
| Method Blank                  | KQ1811637-02MB  | NA             | NA            | 10 mL           | 10.5 mL        |                |
| Duplicate                     | KQ1811637-03DUP | 8/17/18        | 8/21/18       | 10 mL           | 10.5 mL        |                |
| Matrix Spike                  | KQ1811637-04MS  | 8/17/18        | 8/21/18       | 10 mL           | 11 mL          |                |

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Prep Summary Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597

**Metals**

**Prep Method:** EPA CLP-METALS ILM04.0  
**Analytical Method:** 6010C

**Extraction Lot:** 323133

**Extraction Date:** 10/02/18 12:39 ✓

| Sample Name                             | Lab Code         | Date Collected | Date Received | Sample Amount ✓ | Final Amount ✓ | Percent Solids |
|-----------------------------------------|------------------|----------------|---------------|-----------------|----------------|----------------|
| Rinsate Blank-Northern Pike 8/03        | K1807597-020     | 8/3/18         | 8/24/18       | 10 mL           | 10.5 mL        |                |
| Homogenization Blank-Northern Pike 8/03 | K1807597-021     | 8/3/18         | 8/24/18       | 10 mL           | 10.5 mL        |                |
| Homogenization Blank-Northern Pike 8/03 | K1807597-022     | 8/3/18         | 8/24/18       | 10 mL           | 10.5 mL        |                |
| Lab Control Sample                      | KQ1813871-01LCS  | NA             | NA            | 10 mL           | 10.8 mL        |                |
| Duplicate Lab Control Sample            | KQ1813871-02DLCS | NA             | NA            | 10 mL           | 10.8 mL        |                |
| Method Blank                            | KQ1813871-03MB   | NA             | NA            | 10 mL           | 10.5 mL        |                |

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Prep Summary Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597

**Metals**

**Prep Method:** EPA CLP-METALS ILM04.0  
**Analytical Method:** 6020A

**Extraction Lot:** 321145  
**Extraction Date:** 09/04/18 11:36 ✓

| Sample Name                   | Lab Code        | Date Collected | Date Received | Sample Amount ✓ | Final Amount ✓ | Percent Solids |
|-------------------------------|-----------------|----------------|---------------|-----------------|----------------|----------------|
| Rinsate Blank K1807185        | K1807597-002    | 8/14/18        | 8/15/18       | 10 mL           | 10 mL          |                |
| Homogenization Blank K1807185 | K1807597-003    | 8/14/18        | 8/15/18       | 10 mL           | 10 mL          |                |
| Homogenization Blank K1807185 | K1807597-004    | 8/14/18        | 8/15/18       | 10 mL           | 10 mL          |                |
| Rinsate Blank K1807185        | K1807597-005    | 8/15/18        | 8/15/18       | 10 mL           | 10 mL          |                |
| Homogenization Blank K1807185 | K1807597-006    | 8/15/18        | 8/15/18       | 10 mL           | 10 mL          |                |
| Homogenization Blank K1807185 | K1807597-007    | 8/15/18        | 8/15/18       | 10 mL           | 10 mL          |                |
| Method Blank                  | KQ1812163-01MB  | NA             | NA            | 10 mL           | 10 mL          |                |
| Lab Control Sample            | KQ1812163-02LCS | NA             | NA            | 10 mL           | 10.3 mL        |                |
| Duplicate                     | KQ1812163-03DUP | 8/14/18        | 8/15/18       | 10 mL           | 10 mL          |                |
| Matrix Spike                  | KQ1812163-04MS  | 8/14/18        | 8/15/18       | 10 mL           | 10.3 mL        |                |

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Prep Summary Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:**K1807597

**Metals**

**Prep Method:** EPA CLP-METALS ILM04.0  
**Analytical Method:** 6020A

**Extraction Lot:** 320503

**Extraction Date:** 08/27/18 16:29 ✓

| Sample Name                   | Lab Code        | Date Collected | Date Received | Sample Amount ✓ | Final Amount ✓ | Percent Solids |
|-------------------------------|-----------------|----------------|---------------|-----------------|----------------|----------------|
| Rinsate Blank K1807185        | K1807597-008    | 8/17/18        | 8/21/18       | 10 mL           | 10 mL          |                |
| Homogenization Blank K1807185 | K1807597-009    | 8/17/18        | 8/21/18       | 10 mL           | 10 mL          |                |
| Homogenization Blank K1807185 | K1807597-010    | 8/17/18        | 8/21/18       | 10 mL           | 10 mL          |                |
| Rinsate Blank K1807189        | K1807597-011    | 8/21/18        | 8/22/18       | 10 mL           | 10 mL          |                |
| Homogenization Blank K1807189 | K1807597-012    | 8/21/18        | 8/22/18       | 10 mL           | 10 mL          |                |
| Homogenization Blank K1807189 | K1807597-013    | 8/21/18        | 8/22/18       | 10 mL           | 10 mL          |                |
| Rinsate Blank K1807189        | K1807597-014    | 8/22/18        | 8/22/18       | 10 mL           | 10 mL          |                |
| Homogenization Blank K1807189 | K1807597-015    | 8/22/18        | 8/22/18       | 10 mL           | 10 mL          |                |
| Homogenization Blank K1807189 | K1807597-016    | 8/22/18        | 8/22/18       | 10 mL           | 10 mL          |                |
| Rinsate Blank K1807189        | K1807597-017    | 8/24/18        | 8/24/18       | 10 mL           | 10 mL          |                |
| Homogenization Blank K1807189 | K1807597-018    | 8/24/18        | 8/24/18       | 10 mL           | 10 mL          |                |
| Homogenization Blank K1807189 | K1807597-019    | 8/24/18        | 8/24/18       | 10 mL           | 10 mL          |                |
| Method Blank                  | KQ1811638-01MB  | NA             | NA            | 10 mL           | 10 mL          |                |
| Lab Control Sample            | KQ1811638-02LCS | NA             | NA            | 10 mL           | 10.3 mL        |                |
| Duplicate                     | KQ1811638-03DUP | 8/17/18        | 8/21/18       | 10 mL           | 10 mL          |                |
| Matrix Spike                  | KQ1811638-04MS  | 8/17/18        | 8/21/18       | 10 mL           | 10.3 mL        |                |

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## Prep Summary Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:**K1807597**Metals**

**Prep Method:** EPA CLP-METALS ILM04.0  
**Analytical Method:** 6020A

**Extraction Lot:** 323136  
**Extraction Date:** 10/02/18 12:39

| <b>Sample Name</b>                      | <b>Lab Code</b>  | <b>Date<br/>Collected</b> | <b>Date<br/>Received</b> | <b>Sample<br/>Amount</b> | <b>Final<br/>Amount</b> | <b>Percent<br/>Solids</b> |
|-----------------------------------------|------------------|---------------------------|--------------------------|--------------------------|-------------------------|---------------------------|
| Rinsate Blank-Northern Pike 8/03        | K1807597-020     | 8/3/18                    | 8/24/18                  | 10 mL                    | 10 mL                   |                           |
| Homogenization Blank-Northern Pike 8/03 | K1807597-021     | 8/3/18                    | 8/24/18                  | 10 mL                    | 10 mL                   |                           |
| Homogenization Blank-Northern Pike 8/03 | K1807597-022     | 8/3/18                    | 8/24/18                  | 10 mL                    | 10 mL                   |                           |
| Method Blank                            | KQ1813873-01MB   | NA                        | NA                       | 10 mL                    | 10 mL                   |                           |
| Lab Control Sample                      | KQ1813873-02LCS  | NA                        | NA                       | 10 mL                    | 10.3 mL                 |                           |
| Duplicate Lab Control Sample            | KQ1813873-03DLCS | NA                        | NA                       | 10 mL                    | 10.3 mL                 |                           |

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Prep Summary Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597

**Metals**

**Prep Method:** EPA 3010A  
**Analytical Method:** 7742

**Extraction Lot:** 320197  
**Extraction Date:** 08/23/18 09:10 ✓

| Sample Name                   | Lab Code        | Date Collected | Date Received | Sample Amount ✓ | Final Amount ✓ | Percent Solids |
|-------------------------------|-----------------|----------------|---------------|-----------------|----------------|----------------|
| Rinsate Blank K1807185        | K1807597-002    | 8/14/18        | 8/15/18       | 25 mL           | 25 mL          |                |
| Homogenization Blank K1807185 | K1807597-003    | 8/14/18        | 8/15/18       | 25 mL           | 25 mL          |                |
| Homogenization Blank K1807185 | K1807597-004    | 8/14/18        | 8/15/18       | 25 mL           | 25 mL          |                |
| Rinsate Blank K1807185        | K1807597-005    | 8/15/18        | 8/15/18       | 25 mL           | 25 mL          |                |
| Homogenization Blank K1807185 | K1807597-006    | 8/15/18        | 8/15/18       | 25 mL           | 25 mL          |                |
| Homogenization Blank K1807185 | K1807597-007    | 8/15/18        | 8/15/18       | 25 mL           | 25 mL          |                |
| Method Blank                  | KQ1811402-01MB  | NA             | NA            | 25 mL           | 25 mL          |                |
| Lab Control Sample            | KQ1811402-02LCS | NA             | NA            | 25 mL           | 25 mL          |                |
| Duplicate                     | KQ1811402-03DUP | 8/6/18         | 8/10/18       | 25 mL           | 25 mL          |                |
| Matrix Spike                  | KQ1811402-04MS  | 8/6/18         | 8/10/18       | 25 mL           | 25 mL          |                |

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Prep Summary Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597

**Metals**

**Prep Method:** EPA 3010A  
**Analytical Method:** 7742

**Extraction Lot:** 320504  
**Extraction Date:** 08/27/18 12:59

| Sample Name                   | Lab Code        | Date Collected | Date Received | Sample Amount | Final Amount | Percent Solids |
|-------------------------------|-----------------|----------------|---------------|---------------|--------------|----------------|
| Rinsate Blank K1807185        | K1807597-008    | 8/17/18        | 8/21/18       | 25 mL         | 25 mL        |                |
| Homogenization Blank K1807185 | K1807597-009    | 8/17/18        | 8/21/18       | 25 mL         | 25 mL        |                |
| Homogenization Blank K1807185 | K1807597-010    | 8/17/18        | 8/21/18       | 25 mL         | 25 mL        |                |
| Rinsate Blank K1807189        | K1807597-011    | 8/21/18        | 8/22/18       | 25 mL         | 25 mL        |                |
| Homogenization Blank K1807189 | K1807597-012    | 8/21/18        | 8/22/18       | 25 mL         | 25 mL        |                |
| Homogenization Blank K1807189 | K1807597-013    | 8/21/18        | 8/22/18       | 25 mL         | 25 mL        |                |
| Rinsate Blank K1807189        | K1807597-014    | 8/22/18        | 8/22/18       | 25 mL         | 25 mL        |                |
| Homogenization Blank K1807189 | K1807597-015    | 8/22/18        | 8/22/18       | 25 mL         | 25 mL        |                |
| Homogenization Blank K1807189 | K1807597-016    | 8/22/18        | 8/22/18       | 25 mL         | 25 mL        |                |
| Rinsate Blank K1807189        | K1807597-017    | 8/24/18        | 8/24/18       | 25 mL         | 25 mL        |                |
| Homogenization Blank K1807189 | K1807597-018    | 8/24/18        | 8/24/18       | 25 mL         | 25 mL        |                |
| Homogenization Blank K1807189 | K1807597-019    | 8/24/18        | 8/24/18       | 25 mL         | 25 mL        |                |
| Method Blank                  | KQ1811639-01MB  | NA             | NA            | 25 mL         | 25 mL        |                |
| Lab Control Sample            | KQ1811639-02LCS | NA             | NA            | 25 mL         | 25 mL        |                |
| Duplicate                     | KQ1811639-03DUP | 8/17/18        | 8/21/18       | 25 mL         | 25 mL        |                |
| Matrix Spike                  | KQ1811639-04MS  | 8/17/18        | 8/21/18       | 25 mL         | 25 mL        |                |
| Method Detection Limit        | KQ1811639-05MDL | 8/17/18        | 8/21/18       | 50 mL         | 50 mL        |                |

ALS Group USA, Corp.  
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Prep Summary Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597

**Metals**

**Prep Method:** EPA 3010A  
**Analytical Method:** 7742

**Extraction Lot:** 323134  
**Extraction Date:** 10/02/18 11:37

| Sample Name                             | Lab Code         | Date Collected | Date Received | Sample Amount | Final Amount | Percent Solids |
|-----------------------------------------|------------------|----------------|---------------|---------------|--------------|----------------|
| Rinsate Blank-Northern Pike 8/03        | K1807597-020     | 8/3/18         | 8/24/18       | 25 mL         | 25 mL        |                |
| Homogenization Blank-Northern Pike 8/03 | K1807597-021     | 8/3/18         | 8/24/18       | 25 mL         | 25 mL        |                |
| Homogenization Blank-Northern Pike 8/03 | K1807597-022     | 8/3/18         | 8/24/18       | 25 mL         | 25 mL        |                |
| Method Blank                            | KQ1813872-01MB   | NA             | NA            | 25 mL         | 25 mL        |                |
| Lab Control Sample                      | KQ1813872-02LCS  | NA             | NA            | 25 mL         | 25 mL        |                |
| Duplicate Lab Control Sample            | KQ1813872-03DLCS | NA             | NA            | 25 mL         | 25 mL        |                |



ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

Analysis Run Log

Instrument ID: K-ICP-AES-03

Analytical BatchID: 605558

| Sample          | Dilution Factor | Date/Time      | A<br>l | C<br>a | F<br>e | M<br>g | K | N<br>a | S |
|-----------------|-----------------|----------------|--------|--------|--------|--------|---|--------|---|
| ZZZZZZ          | 1               | 09/06/18 12:23 |        |        |        |        |   |        |   |
| ZZZZZZ          | 1               | 09/06/18 12:26 |        |        |        |        |   |        |   |
| ZZZZZZ          | 1               | 09/06/18 12:28 |        |        |        |        |   |        |   |
| ICVB            | 1               | 09/06/18 12:31 | X      | X      |        | X      |   |        | X |
| ICV             | 1               | 09/06/18 12:34 | X      | X      | X      | X      | X | X      |   |
| ICB             | 1               | 09/06/18 12:36 | X      | X      | X      | X      | X | X      | X |
| ZZZZZZ          | 1               | 09/06/18 12:39 |        |        |        |        |   |        |   |
| LLICV           | 1               | 09/06/18 12:44 | X      | X      | X      | X      | X | X      |   |
| LLICV           | 0.5             | 09/06/18 12:47 |        |        |        |        |   |        | X |
| ZZZZZZ          | 1               | 09/06/18 12:50 |        |        |        |        |   |        |   |
| CCVB1           | 1               | 09/06/18 12:52 | X      | X      | X      | X      | X | X      | X |
| CCVA1           | 1               | 09/06/18 12:55 | X      | X      |        | X      |   |        |   |
| CCB             | 1               | 09/06/18 12:57 | X      | X      | X      | X      | X | X      | X |
| ICSA            | 1               | 09/06/18 13:00 |        | X      | X      | X      | X | X      | X |
| ICSAB           | 1               | 09/06/18 13:02 |        | X      | X      | X      | X | X      | X |
| ZZZZZZ          | 200             | 09/06/18 13:29 |        |        |        |        |   |        |   |
| ZZZZZZ          | 200             | 09/06/18 13:31 |        |        |        |        |   |        |   |
| ZZZZZZ          | 200             | 09/06/18 13:34 |        |        |        |        |   |        |   |
| ZZZZZZ          | 200             | 09/06/18 13:36 |        |        |        |        |   |        |   |
| KQ1811637-02MB  | 1               | 09/06/18 13:42 | X      | X      | X      | X      | X | X      | X |
| KQ1811637-01LCS | 1               | 09/06/18 13:45 | X      | X      | X      | X      | X | X      | X |
| K1807597-008    | 1               | 09/06/18 13:47 | X      | X      | X      | X      | X | X      | X |
| K1807597-008SDL | 5               | 09/06/18 13:50 | X      | X      | X      | X      | X | X      | X |
| K1807597-008DUP | 1               | 09/06/18 13:52 | X      | X      | X      | X      | X | X      | X |
| K1807597-008MS  | 1               | 09/06/18 13:55 | X      | X      | X      | X      | X | X      | X |
| CCVB            | 1               | 09/06/18 13:57 | X      | X      | X      | X      | X | X      | X |
| CCVA            | 1               | 09/06/18 14:00 | X      | X      |        | X      |   |        |   |
| CCB             | 1               | 09/06/18 14:02 | X      | X      | X      | X      | X | X      | X |
| K1807597-008PS  | 1               | 09/06/18 14:05 | X      | X      | X      | X      | X | X      | X |
| K1807597-009    | 1               | 09/06/18 14:07 | X      | X      | X      | X      | X | X      | X |
| K1807597-010    | 1               | 09/06/18 14:09 | X      | X      | X      | X      | X | X      | X |
| K1807597-011    | 1               | 09/06/18 14:12 | X      | X      | X      | X      | X | X      | X |
| K1807597-012    | 1               | 09/06/18 14:14 | X      | X      | X      | X      | X | X      | X |
| K1807597-013    | 1               | 09/06/18 14:17 | X      | X      | X      | X      | X | X      | X |
| K1807597-014    | 1               | 09/06/18 14:19 | X      | X      | X      | X      | X | X      | X |
| K1807597-015    | 1               | 09/06/18 14:22 | X      | X      | X      | X      | X | X      | X |
| K1807597-016    | 1               | 09/06/18 14:24 | X      | X      | X      | X      | X | X      | X |

ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

Analysis Run Log

Instrument ID: K-ICP-AES-03

Analytical BatchID: 605558

| Sample          | Dilution Factor | Date/Time      | A<br>l | C<br>a | F<br>e | M<br>g | K | N<br>a | S |
|-----------------|-----------------|----------------|--------|--------|--------|--------|---|--------|---|
| K1807597-017    | 1               | 09/06/18 14:27 | X      | X      | X      | X      | X | X      | X |
| CCVB            | 1               | 09/06/18 14:29 | X      | X      | X      | X      | X | X      | X |
| CCVA            | 1               | 09/06/18 14:32 | X      | X      |        | X      |   |        |   |
| CCB             | 1               | 09/06/18 14:34 | X      | X      | X      | X      | X | X      | X |
| ZZZZZZ          | 1               | 09/06/18 14:37 |        |        |        |        |   |        |   |
| LLCCV           | 1               | 09/06/18 14:42 | X      | X      | X      | X      | X | X      |   |
| ZZZZZZ          | 0.5             | 09/06/18 14:45 |        |        |        |        |   |        |   |
| ZZZZZZ          | 0.5             | 09/06/18 14:54 |        |        |        |        |   |        |   |
| LLCCV 4X        | 1               | 09/06/18 15:02 |        |        |        |        |   |        | X |
| K1807597-018    | 1               | 09/06/18 15:05 | X      | X      | X      | X      | X | X      | X |
| K1807597-019    | 1               | 09/06/18 15:08 | X      | X      | X      | X      | X | X      | X |
| KQ1811403-02MB  | 1               | 09/06/18 15:10 | X      | X      | X      | X      | X | X      | X |
| KQ1811403-01LCS | 1               | 09/06/18 15:13 | X      | X      | X      | X      | X | X      | X |
| ZZZZZZ          | 1               | 09/06/18 15:15 |        |        |        |        |   |        |   |
| CCVB            | 1               | 09/06/18 15:42 | X      | X      | X      | X      | X | X      | X |
| CCVA            | 1               | 09/06/18 15:45 | X      | X      |        | X      |   |        |   |
| CCB             | 1               | 09/06/18 15:48 | X      | X      | X      | X      | X | X      | X |
| K1807597-002    | 1               | 09/06/18 15:51 | X      | X      | X      | X      | X | X      | X |
| K1807597-002SDL | 5               | 09/06/18 15:54 | X      | X      | X      | X      | X | X      | X |
| K1807597-002DUP | 1               | 09/06/18 15:56 | X      | X      | X      | X      | X | X      | X |
| K1807597-002MS  | 1               | 09/06/18 15:59 | X      | X      | X      | X      | X | X      | X |
| K1807597-002PS  | 1               | 09/06/18 16:01 | X      | X      | X      | X      | X | X      | X |
| K1807597-003    | 1               | 09/06/18 16:04 | X      | X      | X      | X      | X | X      | X |
| K1807597-004    | 1               | 09/06/18 16:06 | X      | X      | X      | X      | X | X      | X |
| K1807597-005    | 1               | 09/06/18 16:09 | X      | X      | X      | X      | X | X      | X |
| K1807597-006    | 1               | 09/06/18 16:11 | X      | X      | X      | X      | X | X      | X |
| K1807597-007    | 1               | 09/06/18 16:14 | X      | X      | X      | X      | X | X      | X |
| CCVB            | 1               | 09/06/18 16:16 | X      | X      | X      | X      | X | X      | X |
| CCVA            | 1               | 09/06/18 16:19 | X      | X      |        | X      |   |        |   |
| CCB             | 1               | 09/06/18 16:21 | X      | X      | X      | X      | X | X      | X |
| ZZZZZZ          | 2               | 09/06/18 16:24 |        |        |        |        |   |        |   |
| CCVB            | 1               | 09/06/18 16:32 | X      | X      | X      | X      | X | X      | X |
| CCVA            | 1               | 09/06/18 16:34 | X      | X      |        | X      |   |        |   |
| CCB             | 1               | 09/06/18 16:37 | X      | X      | X      | X      | X | X      | X |
| LLCCV           | 1               | 09/06/18 16:39 | X      | X      | X      | X      | X | X      |   |
| ZZZZZZ          | 0.5             | 09/06/18 16:42 |        |        |        |        |   |        |   |
| LLCCV 4X        | 1               | 09/06/18 16:45 |        |        |        |        |   |        | X |

ALS Group USA, Corp.  
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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

Analysis Run Log

Instrument ID: K-ICP-AES-03

Analytical BatchID: 609389

| Sample           | Dilution Factor | Date/Time      | A<br>l | C<br>a | F<br>e | M<br>g | K | N<br>a | S |
|------------------|-----------------|----------------|--------|--------|--------|--------|---|--------|---|
| ZZZZZZ           | 1               | 10/03/18 11:05 |        |        |        |        |   |        |   |
| ZZZZZZ           | 1               | 10/03/18 11:08 |        |        |        |        |   |        |   |
| ZZZZZZ           | 1               | 10/03/18 11:10 |        |        |        |        |   |        |   |
| ICVB             | 1               | 10/03/18 11:13 | X      | X      |        | X      |   |        | X |
| ICV              | 1               | 10/03/18 11:16 | X      | X      | X      | X      | X | X      |   |
| ICB              | 1               | 10/03/18 11:19 | X      | X      | X      | X      | X | X      | X |
| ICB              | 1               | 10/03/18 11:23 | X      | X      | X      | X      | X | X      | X |
| ZZZZZZ           | 1               | 10/03/18 11:25 |        |        |        |        |   |        |   |
| LLICV            | 1               | 10/03/18 11:30 | X      | X      | X      | X      | X | X      | X |
| ZZZZZZ           | 0.5             | 10/03/18 11:33 |        |        |        |        |   |        |   |
| CCVB1            | 1               | 10/03/18 11:36 | X      | X      | X      | X      | X | X      | X |
| CCVA1            | 1               | 10/03/18 11:39 | X      | X      |        | X      |   |        |   |
| CCB              | 1               | 10/03/18 11:42 | X      | X      | X      | X      | X | X      | X |
| ICSA             | 1               | 10/03/18 11:44 |        | X      | X      |        | X | X      | X |
| ICSAB            | 1               | 10/03/18 11:47 |        | X      | X      |        | X | X      | X |
| ZZZZZZ           | 1               | 10/03/18 12:03 |        |        |        |        |   |        |   |
| KQ1813871-01LCS  | 1               | 10/03/18 12:06 | X      | X      | X      | X      | X | X      | X |
| KQ1813871-02DLCS | 1               | 10/03/18 12:08 | X      | X      | X      | X      | X | X      | X |
| K1807597-020     | 1               | 10/03/18 12:11 | X      | X      | X      | X      | X | X      | X |
| K1807597-021     | 1               | 10/03/18 12:14 | X      | X      | X      | X      | X | X      | X |
| K1807597-022     | 1               | 10/03/18 12:16 | X      | X      | X      | X      | X | X      | X |
| KQ1813871-03MB   | 1               | 10/03/18 12:19 | X      | X      | X      | X      | X | X      | X |
| ZZZZZZ           | 1               | 10/03/18 12:22 |        |        |        |        |   |        |   |
| ZZZZZZ           | 1               | 10/03/18 12:25 |        |        |        |        |   |        |   |
| ZZZZZZ           | 1               | 10/03/18 12:27 |        |        |        |        |   |        |   |
| CCVB             | 1               | 10/03/18 12:32 | X      | X      | X      | X      | X | X      | X |
| CCVA             | 1               | 10/03/18 12:35 | X      | X      |        | X      |   |        |   |
| CCB              | 1               | 10/03/18 12:37 | X      | X      | X      | X      | X | X      | X |
| ZZZZZZ           | 1               | 10/03/18 12:41 |        |        |        |        |   |        |   |
| LLCCV            | 1               | 10/03/18 12:44 | X      | X      |        | X      | X | X      | X |
| LLCCV            | 0.5             | 10/03/18 12:47 |        |        | X      |        |   |        |   |
| ZZZZZZ           | 1               | 10/03/18 12:50 |        |        |        |        |   |        |   |
| ZZZZZZ           | 1               | 10/03/18 12:52 |        |        |        |        |   |        |   |
| ZZZZZZ           | 1               | 10/03/18 12:55 |        |        |        |        |   |        |   |
| ZZZZZZ           | 1               | 10/03/18 12:58 |        |        |        |        |   |        |   |
| ZZZZZZ           | 1               | 10/03/18 13:00 |        |        |        |        |   |        |   |
| ZZZZZZ           | 1               | 10/03/18 13:03 |        |        |        |        |   |        |   |

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

Analysis Run Log

Instrument ID: K-ICP-MS-04

Analytical BatchID: 604716

| Sample | Dilution Factor | Date/Time      | Sb | As | Ba | Be | Ca | Co | Cu | Pb | Mn | Ni | S | Se | Tl | U | V | Zn |
|--------|-----------------|----------------|----|----|----|----|----|----|----|----|----|----|---|----|----|---|---|----|
| ZZZZZZ | 1               | 08/30/18 11:24 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 1               | 08/30/18 11:28 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ICV    | 1               | 08/30/18 11:32 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X  | X  | X | X | X  |
| CCV    | 1               | 08/30/18 11:37 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X  | X  | X | X | X  |
| ICB    | 1               | 08/30/18 11:41 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X  | X  | X | X | X  |
| CCB    | 1               | 08/30/18 11:45 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X  | X  | X | X | X  |
| ZZZZZZ | 1               | 08/30/18 11:50 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| LLICVW | 1               | 08/30/18 11:54 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X  | X  | X | X | X  |
| ICSA   | 1               | 08/30/18 12:00 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X  | X  | X | X | X  |
| ICSAB  | 1               | 08/30/18 12:04 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X  | X  | X | X | X  |
| ZZZZZZ | 1               | 08/30/18 12:19 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 1               | 08/30/18 12:24 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 1               | 08/30/18 12:28 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 1               | 08/30/18 12:32 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 1               | 08/30/18 12:37 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 1               | 08/30/18 12:41 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 1               | 08/30/18 12:45 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 1               | 08/30/18 12:50 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 1               | 08/30/18 12:54 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 5               | 08/30/18 12:58 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| CCV    | 1               | 08/30/18 13:03 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X  | X  | X | X | X  |
| CCB    | 1               | 08/30/18 13:07 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X  | X  | X | X | X  |
| ZZZZZZ | 1               | 08/30/18 13:11 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 1               | 08/30/18 13:18 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 1               | 08/30/18 13:23 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 1               | 08/30/18 13:27 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 1               | 08/30/18 13:31 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 1               | 08/30/18 13:36 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 1               | 08/30/18 13:40 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 1               | 08/30/18 13:44 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 5               | 08/30/18 13:49 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 1               | 08/30/18 13:53 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| CCV    | 1               | 08/30/18 13:57 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X  | X  | X | X | X  |
| CCB    | 1               | 08/30/18 14:01 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X  | X  | X | X | X  |
| LLCCVW | 1               | 08/30/18 14:45 |    | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X  | X  | X | X | X  |
| LLCCVW | 1               | 08/30/18 15:01 | X  |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |
| ZZZZZZ | 1               | 08/30/18 15:05 |    |    |    |    |    |    |    |    |    |    |   |    |    |   |   |    |

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

Analysis Run Log

Instrument ID: K-ICP-MS-04

Analytical BatchID: 604716

| Sample          | Dilution Factor | Date/Time      | Sb | As | Ba | Be | Ca | Co | Cu | Pb | Mn | Ni | Ag | Tl | U | V | Zn |
|-----------------|-----------------|----------------|----|----|----|----|----|----|----|----|----|----|----|----|---|---|----|
| ZZZZZZ          | 1               | 08/30/18 15:10 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ          | 1               | 08/30/18 15:14 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ          | 1               | 08/30/18 15:18 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ          | 1               | 08/30/18 15:23 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ          | 1               | 08/30/18 15:27 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| KQ1811638-01MB  | 1               | 08/30/18 15:32 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| KQ1811638-02LCS | 1               | 08/30/18 15:36 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-008    | 1               | 08/30/18 15:40 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-009    | 1               | 08/30/18 15:45 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| CCV             | 1               | 08/30/18 15:49 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| CCB             | 1               | 08/30/18 15:53 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-009DUP | 1               | 08/30/18 16:03 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ZZZZZZ -009L    | +5              | 08/30/18 16:07 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| K1807597-009PS  | 1               | 08/30/18 16:11 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-009MS  | 1               | 08/30/18 16:15 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-010    | 1               | 08/30/18 16:20 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-011    | 1               | 08/30/18 16:24 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-012    | 1               | 08/30/18 16:28 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-013    | 1               | 08/30/18 16:33 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-014    | 1               | 08/30/18 16:37 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-015    | 1               | 08/30/18 16:41 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| CCV             | 1               | 08/30/18 16:46 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| CCB             | 1               | 08/30/18 16:50 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-016    | 1               | 08/30/18 16:54 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-017    | 1               | 08/30/18 16:59 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-018    | 1               | 08/30/18 17:03 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-019    | 1               | 08/30/18 17:07 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ZZZZZZ          | 1               | 08/30/18 17:12 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ          | 1               | 08/30/18 17:16 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ          | 1               | 08/30/18 17:20 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ          | 1               | 08/30/18 17:25 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ          | 1               | 08/30/18 17:30 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ          | 1               | 08/30/18 17:37 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| CCV             | 1               | 08/30/18 17:42 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| CCB             | 1               | 08/30/18 17:46 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| LLCCVW          | 1               | 08/30/18 17:50 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| LLCCVW          | 1               | 08/30/18 17:55 | X  |    |    |    |    |    |    |    |    |    |    |    |   |   |    |

neg bias

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

Analysis Run Log

Instrument ID: K-ICP-MS-04

Analytical BatchID: 605777

| Sample          | Dilution Factor | Date/Time      | Sb | As | Ba | Bd | Ca | Co | Cr | Cu | Pb | Mn | Ni | Sg | Al | Tl | U | V | Zn |
|-----------------|-----------------|----------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|----|
| ZZZZZZ          | 1               | 09/07/18 15:31 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ          | 1               | 09/07/18 15:35 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ICV             | 1               | 09/07/18 15:39 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| CCV             | 1               | 09/07/18 15:43 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ICB             | 1               | 09/07/18 15:48 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| CCB             | 1               | 09/07/18 15:52 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ZZZZZZ          | 1               | 09/07/18 15:56 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| LLICVW          | 1               | 09/07/18 16:00 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ICSA            | 1               | 09/07/18 16:04 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ICSAB           | 1               | 09/07/18 16:08 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| KQ1812163-01MB  | 1               | 09/07/18 16:13 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| KQ1812163-02LCS | 1               | 09/07/18 16:17 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ZZZZZZ          | 1               | 09/07/18 16:21 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| K1807597-002    | 1               | 09/07/18 16:25 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-003    | 1               | 09/07/18 16:30 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-004    | 1               | 09/07/18 16:34 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-004DUP | 1               | 09/07/18 16:38 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-004SDL | 5               | 09/07/18 16:42 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-004PS  | 1               | 09/07/18 16:46 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-004MS  | 1               | 09/07/18 16:51 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| CCV             | 1               | 09/07/18 16:55 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| CCB             | 1               | 09/07/18 16:59 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-005    | 1               | 09/07/18 17:03 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-006    | 1               | 09/07/18 17:07 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-007    | 1               | 09/07/18 17:12 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ZZZZZZ          | 1               | 09/07/18 17:16 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ          | 1               | 09/07/18 17:20 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ          | 1               | 09/07/18 17:24 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ          | 1               | 09/07/18 17:28 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ          | 1               | 09/07/18 17:32 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ          | 1               | 09/07/18 17:37 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ          | 1               | 09/07/18 17:41 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| CCV             | 1               | 09/07/18 17:45 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| CCB             | 1               | 09/07/18 17:49 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ZZZZZZ          | 1               | 09/07/18 17:53 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| LLCCVW          | 1               | 09/07/18 17:59 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ZZZZZZ          | 1               | 09/07/18 18:03 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

Analysis Run Log

Instrument ID: K-ICP-MS-05

Analytical BatchID: 609313

| Sample           | Dilution Factor | Date/Time      | Sb | As | Ba | Be | Ca | Co | Cu | Pb | Mn | Ni | Ag | Tl | U | V | Zn |
|------------------|-----------------|----------------|----|----|----|----|----|----|----|----|----|----|----|----|---|---|----|
| ZZZZZZ           | 1               | 10/03/18 09:04 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ           | 1               | 10/03/18 09:07 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ICV              | 1               | 10/03/18 09:09 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| CCV              | 1               | 10/03/18 09:12 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ICB              | 1               | 10/03/18 09:14 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| CCB              | 1               | 10/03/18 09:17 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ZZZZZZ           | 1               | 10/03/18 09:20 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| LLICVW           | 1               | 10/03/18 09:26 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ICSA             | 1               | 10/03/18 09:28 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ICSAB            | 1               | 10/03/18 09:31 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| KQ1813873-01MB   | 1               | 10/03/18 09:39 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| KQ1813873-02LCS  | 1               | 10/03/18 09:41 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| KQ1813873-03DLCS | 1               | 10/03/18 09:44 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-020     | 1               | 10/03/18 09:46 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-021     | 1               | 10/03/18 09:49 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| K1807597-022     | 1               | 10/03/18 09:51 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ZZZZZZ           | 1               | 10/03/18 09:54 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ           | 1               | 10/03/18 09:56 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| CCV              | 1               | 10/03/18 09:59 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ZZZZZZ           | 1               | 10/03/18 10:01 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| CCB              | 1               | 10/03/18 10:04 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ZZZZZZ           | 1               | 10/03/18 10:06 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ           | 1               | 10/03/18 10:09 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ           | 5               | 10/03/18 10:11 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ           | 1               | 10/03/18 10:14 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ           | 1               | 10/03/18 10:16 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ           | 1               | 10/03/18 10:19 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ           | 1               | 10/03/18 10:21 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ           | 1               | 10/03/18 10:24 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ           | 1               | 10/03/18 10:26 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| CCV              | 1               | 10/03/18 10:29 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| CCB              | 1               | 10/03/18 10:33 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ZZZZZZ           | 1               | 10/03/18 10:37 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ           | 1               | 10/03/18 10:40 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ           | 1               | 10/03/18 10:42 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ           | 1               | 10/03/18 10:45 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ           | 1               | 10/03/18 10:47 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |

ALS Group USA, Corp.  
dba ALS Environmental

QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

Analysis Run Log

Instrument ID: K-ICP-MS-05

Analytical BatchID: 609313

| Sample | Dilution Factor | Date/Time      | Sb | As | Ba | Bd | Cr | Co | Cu | Pb | Mn | Ni | Ag | Tl | U | V | Zn |
|--------|-----------------|----------------|----|----|----|----|----|----|----|----|----|----|----|----|---|---|----|
| ZZZZZZ | 1               | 10/03/18 10:50 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 10:52 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 10:55 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| CCV    | 1               | 10/03/18 10:57 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| CCB    | 1               | 10/03/18 11:01 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ZZZZZZ | 1               | 10/03/18 11:04 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 11:06 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 11:09 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 11:11 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 11:14 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 11:16 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 11:19 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| CCV    | 1               | 10/03/18 11:21 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| CCB    | 1               | 10/03/18 11:25 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| LLCCVW | 1               | 10/03/18 11:28 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ZZZZZZ | 1               | 10/03/18 11:30 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 11:33 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 11:35 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 11:38 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 11:40 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 11:43 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 11:45 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 11:48 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 11:50 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 11:53 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| CCV    | 1               | 10/03/18 11:55 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| CCB    | 1               | 10/03/18 11:59 | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X  | X | X | X  |
| ZZZZZZ | 1               | 10/03/18 12:01 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 12:04 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 12:06 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 12:09 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 12:11 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 12:14 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 12:16 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 12:19 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 12:21 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |
| ZZZZZZ | 1               | 10/03/18 12:24 |    |    |    |    |    |    |    |    |    |    |    |    |   |   |    |



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QA/QC Report

Client: Teck American Incorporated

Service Request: K1807597

Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Analysis Run Log

Instrument ID: K-ICP-MS-05

Analytical BatchID: 609313

| Sample          | Dilution Factor | Date/Time      | S | A | B | B | C | C | C | C | P | M | N | A | T | U | V | Z |
|-----------------|-----------------|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|                 |                 |                | b | s | a | e | d | r | o | u | b | n | i | g | l |   |   | n |
| CCV             | 1               | 10/03/18 12:27 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CCB             | 1               | 10/03/18 12:30 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| ZZZZZZ          | 1               | 10/03/18 12:32 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| CCV             | 1               | 10/03/18 12:35 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CCB             | 1               | 10/03/18 12:37 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| KQ1813873-02LCS | 1               | 10/03/18 12:51 | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| CCV             | 1               | 10/03/18 12:54 |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |
| CCB             | 1               | 10/03/18 12:58 |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |
| LLCCVW          | 1               | 10/03/18 13:00 |   |   |   |   |   |   |   |   |   |   |   |   |   | X |   |   |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks

**Service Request:** K1807597

**Analysis Run Log**

**Instrument ID:** K-FLAA-02

**Analytical BatchID:** 604386

| Sample          | Dilution Factor | Date/Time      | Se |
|-----------------|-----------------|----------------|----|
| ZZZZZZ          | 1               | 08/28/18 10:53 |    |
| ZZZZZZ          | 1               | 08/28/18 10:55 |    |
| ZZZZZZ          | 1               | 08/28/18 10:57 |    |
| ZZZZZZ          | 1               | 08/28/18 11:00 |    |
| ZZZZZZ          | 1               | 08/28/18 11:02 |    |
| ZZZZZZ          | 1               | 08/28/18 11:04 |    |
| ICV             | 1               | 08/28/18 11:07 | X  |
| ICB             | 1               | 08/28/18 11:09 | X  |
| LLICV           | 1               | 08/28/18 11:11 | X  |
| CCV             | 1               | 08/28/18 11:14 | X  |
| CCB             | 1               | 08/28/18 11:16 | X  |
| ZZZZZZ          | 2               | 08/28/18 11:18 |    |
| KQ1811402-01MB  | 2               | 08/28/18 11:21 | X  |
| KQ1811402-02LCS | 2               | 08/28/18 11:23 | X  |
| ZZZZZZ          | 2               | 08/28/18 11:25 |    |
| K1807597-001PS  | 2               | 08/28/18 11:28 | X  |
| K1807597-001DUP | 2               | 08/28/18 11:30 | X  |
| K1807597-001MS  | 4               | 08/28/18 11:32 | X  |
| K1807597-002    | 2               | 08/28/18 11:35 | X  |
| K1807597-003    | 2               | 08/28/18 11:37 | X  |
| K1807597-004    | 2               | 08/28/18 11:39 | X  |
| CCV             | 1               | 08/28/18 11:42 | X  |
| CCB             | 1               | 08/28/18 11:44 | X  |
| K1807597-005    | 2               | 08/28/18 11:46 | X  |
| K1807597-006    | 2               | 08/28/18 11:48 | X  |
| K1807597-007    | 2               | 08/28/18 11:51 | X  |
| KQ1811639-01MB  | 2               | 08/28/18 11:53 | X  |
| KQ1811639-02LCS | 2               | 08/28/18 11:55 | X  |
| K1807597-010    | 2               | 08/28/18 11:58 | X  |
| K1807597-010PS  | 2               | 08/28/18 12:00 | X  |
| K1807597-010DUP | 2               | 08/28/18 12:02 | X  |
| K1807597-010MS  | 4               | 08/28/18 12:05 | X  |
| K1807597-008    | 2               | 08/28/18 12:07 | X  |
| CCV             | 1               | 08/28/18 12:09 | X  |
| CCB             | 1               | 08/28/18 12:12 | X  |
| K1807597-009    | 2               | 08/28/18 12:14 | X  |
| K1807597-011    | 2               | 08/28/18 12:16 | X  |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks

**Service Request:** K1807597

**Analysis Run Log**

**Instrument ID:** K-FLAA-02

**Analytical BatchID:** 604386

| Sample       | Dilution Factor | Date/Time      | S e |
|--------------|-----------------|----------------|-----|
| K1807597-012 | 2               | 08/28/18 12:19 | X   |
| K1807597-013 | 2               | 08/28/18 12:21 | X   |
| K1807597-014 | 2               | 08/28/18 12:23 | X   |
| K1807597-015 | 2               | 08/28/18 12:26 | X   |
| K1807597-016 | 2               | 08/28/18 12:28 | X   |
| K1807597-017 | 2               | 08/28/18 12:30 | X   |
| K1807597-018 | 2               | 08/28/18 12:32 | X   |
| K1807597-019 | 2               | 08/28/18 12:35 | X   |
| CCV          | 1               | 08/28/18 12:37 | X   |
| CCB          | 1               | 08/28/18 12:39 | X   |
| ZZZZZZ       | 10              | 08/28/18 12:42 |     |
| ZZZZZZ       | 500             | 08/28/18 12:44 |     |
| ZZZZZZ       | 10              | 08/28/18 12:46 |     |
| ZZZZZZ       | 10              | 08/28/18 12:49 |     |
| ZZZZZZ       | 10              | 08/28/18 12:51 |     |
| ZZZZZZ       | 200             | 08/28/18 12:53 |     |
| ZZZZZZ       | 10              | 08/28/18 12:56 |     |
| ZZZZZZ       | 10              | 08/28/18 12:58 |     |
| ZZZZZZ       | 10              | 08/28/18 13:00 |     |
| ZZZZZZ       | 10              | 08/28/18 13:03 |     |
| ZZZZZZ       | 1               | 08/28/18 13:05 |     |
| ZZZZZZ       | 1               | 08/28/18 13:07 |     |
| ZZZZZZ       | 10              | 08/28/18 13:10 |     |
| ZZZZZZ       | 1               | 08/28/18 13:12 |     |
| ZZZZZZ       | 1               | 08/28/18 13:14 |     |

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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

Analysis Run Log

Instrument ID: K-FLAA-02

Analytical BatchID: 609410

| Sample           | Dilution Factor | Date/Time      | Se |
|------------------|-----------------|----------------|----|
| ZZZZZZ           | 1               | 10/03/18 11:10 |    |
| ZZZZZZ           | 1               | 10/03/18 11:12 |    |
| ZZZZZZ           | 1               | 10/03/18 11:14 |    |
| ZZZZZZ           | 1               | 10/03/18 11:16 |    |
| ZZZZZZ           | 1               | 10/03/18 11:19 |    |
| ZZZZZZ           | 1               | 10/03/18 11:21 |    |
| ICV              | 1               | 10/03/18 11:24 | X  |
| ICB              | 1               | 10/03/18 11:26 | X  |
| LLICV            | 1               | 10/03/18 11:28 | X  |
| CCV              | 1               | 10/03/18 11:30 | X  |
| CCB              | 1               | 10/03/18 11:33 | X  |
| KQ1813872-01MB   | 2               | 10/03/18 11:35 | X  |
| KQ1813872-02LCS  | 2               | 10/03/18 11:37 | X  |
| KQ1813872-03DLCS | 2               | 10/03/18 11:40 | X  |
| K1807597-020     | 2               | 10/03/18 11:42 | X  |
| K1807597-020PS   | 2               | 10/03/18 11:44 | X  |
| K1807597-021     | 2               | 10/03/18 11:47 | X  |
| K1807597-022     | 2               | 10/03/18 11:49 | X  |
| ZZZZZZ           | 2               | 10/03/18 11:51 |    |
| ZZZZZZ           | 2               | 10/03/18 11:54 |    |
| ZZZZZZ           | 2               | 10/03/18 11:56 |    |
| CCV              | 1               | 10/03/18 11:58 | X  |
| CCB              | 1               | 10/03/18 12:01 | X  |
| ZZZZZZ           | 2               | 10/03/18 12:03 |    |
| ZZZZZZ           | 2               | 10/03/18 12:05 |    |
| ZZZZZZ           | 4               | 10/03/18 12:08 |    |
| ZZZZZZ           | 2               | 10/03/18 12:10 |    |
| ZZZZZZ           | 2               | 10/03/18 12:12 |    |
| ZZZZZZ           | 2               | 10/03/18 12:15 |    |
| ZZZZZZ           | 2               | 10/03/18 12:17 |    |
| ZZZZZZ           | 2               | 10/03/18 12:19 |    |
| ZZZZZZ           | 2               | 10/03/18 12:22 |    |
| ZZZZZZ           | 2               | 10/03/18 12:24 |    |
| ZZZZZZ           | 1               | 10/03/18 12:26 |    |
| ZZZZZZ           | 1               | 10/03/18 12:29 |    |
| ZZZZZZ           | 1               | 10/03/18 12:32 |    |
| ZZZZZZ           | 2               | 10/03/18 12:34 |    |

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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument ID: K-ICP-MS-04

Analytical BatchID: 604716

| Sample | Date/Time      | LiSTD | GeSTD | ScKED2 | GeKED3 | GeKED2 | GeKED1 | RhKED2 |
|--------|----------------|-------|-------|--------|--------|--------|--------|--------|
| ZZZZZZ | 08/30/18 11:24 |       |       |        |        |        |        |        |
| ZZZZZZ | 08/30/18 11:28 |       |       |        |        |        |        |        |
| ICV    | 08/30/18 11:32 | 100   | 100   | 101    | 99     | 100    | 101    | 100    |
| CCV    | 08/30/18 11:37 | 101   | 102   | 101    | 99     | 100    | 100    | 102    |
| ICB    | 08/30/18 11:41 | 99    | 97    | 102    | 99     | 101    | 100    | 101    |
| CCB    | 08/30/18 11:45 | 103   | 100   | 101    | 97     | 101    | 99     | 100    |
| ZZZZZZ | 08/30/18 11:50 |       |       |        |        |        |        |        |
| LLICVW | 08/30/18 11:54 | 104   | 101   | 103    | 99     | 102    | 101    | 102    |
| ICSA   | 08/30/18 12:00 | 88    | 93    | 92     | 85     | 86     | 84     | 84     |
| ICSAB  | 08/30/18 12:04 | 86    | 91    | 92     | 85     | 86     | 85     | 84     |
| ZZZZZZ | 08/30/18 12:19 |       |       |        |        |        |        |        |
| ZZZZZZ | 08/30/18 12:24 |       |       |        |        |        |        |        |
| ZZZZZZ | 08/30/18 12:28 |       |       |        |        |        |        |        |
| ZZZZZZ | 08/30/18 12:32 |       |       |        |        |        |        |        |
| ZZZZZZ | 08/30/18 12:37 |       |       |        |        |        |        |        |
| ZZZZZZ | 08/30/18 12:41 |       |       |        |        |        |        |        |
| ZZZZZZ | 08/30/18 12:45 |       |       |        |        |        |        |        |
| ZZZZZZ | 08/30/18 12:50 |       |       |        |        |        |        |        |
| ZZZZZZ | 08/30/18 12:54 |       |       |        |        |        |        |        |
| ZZZZZZ | 08/30/18 12:58 |       |       |        |        |        |        |        |
| CCV    | 08/30/18 13:03 | 100   | 102   | 99     | 97     | 98     | 97     | 99     |
| CCB    | 08/30/18 13:07 | 99    | 101   | 98     | 94     | 96     | 95     | 98     |
| ZZZZZZ | 08/30/18 13:11 |       |       |        |        |        |        |        |
| ZZZZZZ | 08/30/18 13:18 |       |       |        |        |        |        |        |
| ZZZZZZ | 08/30/18 13:23 |       |       |        |        |        |        |        |
| ZZZZZZ | 08/30/18 13:27 |       |       |        |        |        |        |        |
| ZZZZZZ | 08/30/18 13:31 |       |       |        |        |        |        |        |
| ZZZZZZ | 08/30/18 13:36 |       |       |        |        |        |        |        |
| ZZZZZZ | 08/30/18 13:40 |       |       |        |        |        |        |        |
| ZZZZZZ | 08/30/18 13:44 |       |       |        |        |        |        |        |
| ZZZZZZ | 08/30/18 13:49 |       |       |        |        |        |        |        |
| ZZZZZZ | 08/30/18 13:53 |       |       |        |        |        |        |        |
| CCV    | 08/30/18 13:57 | 92    | 94    | 90     | 90     | 90     | 90     | 92     |
| CCB    | 08/30/18 14:01 | 93    | 92    | 90     | 90     | 90     | 89     | 92     |
| LLCCVW | 08/30/18 14:45 | 94    | 93    | 90     | 89     | 91     | 84     | 90     |
| LLCCVW | 08/30/18 15:01 | 99    | 99    | 94     | 92     | 94     | 89     | 95     |
| ZZZZZZ | 08/30/18 15:05 |       |       |        |        |        |        |        |

60-125

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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

| LuKED2 | ThKED2 |
|--------|--------|
|        |        |
|        |        |
| 104    | 101    |
| 102    | 100    |
| 103    | 102    |
| 102    | 102    |
|        |        |
| 104    | 103    |
| 99     | 99     |
| 99     | 98     |
|        |        |
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|        |        |
|        |        |
|        |        |
| 104    | 104    |
| 102    | 103    |
|        |        |
|        |        |
|        |        |
|        |        |
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|        |        |
|        |        |
|        |        |
|        |        |
| 97     | 100    |
| 95     | 97     |
| 97     | 99     |
| 101    | 105    |
|        |        |

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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument ID: K-ICP-MS-04

Analytical BatchID: 604716

| Sample          | Date/Time      | LiSTD | GeSTD | ScKED2 | GeKED3 | GeKED2 | GeKED1 | RhKED2 |
|-----------------|----------------|-------|-------|--------|--------|--------|--------|--------|
| ZZZZZZ          | 08/30/18 15:10 |       |       |        |        |        |        |        |
| ZZZZZZ          | 08/30/18 15:14 |       |       |        |        |        |        |        |
| ZZZZZZ          | 08/30/18 15:18 |       |       |        |        |        |        |        |
| ZZZZZZ          | 08/30/18 15:23 |       |       |        |        |        |        |        |
| ZZZZZZ          | 08/30/18 15:27 |       |       |        |        |        |        |        |
| KQ1811638-01MB  | 08/30/18 15:32 | 93    | 94    | 92     | 91     | 92     | 88     | 92     |
| KQ1811638-02LCS | 08/30/18 15:36 | 94    | 95    | 92     | 90     | 91     | 90     | 92     |
| K1807597-008    | 08/30/18 15:40 | 91    | 92    | 91     | 90     | 90     | 89     | 92     |
| K1807597-009    | 08/30/18 15:45 | 92    | 92    | 92     | 91     | 90     | 89     | 92     |
| ZZZZZZ          | 08/30/18 15:49 |       |       |        |        |        |        |        |
| ZZZZZZ          | 08/30/18 15:53 |       |       |        |        |        |        |        |
| K1807597-009DUP | 08/30/18 16:03 | 91    | 91    | 88     | 88     | 89     | 86     | 91     |
| ZZZZZZ          | 08/30/18 16:07 |       |       |        |        |        |        |        |
| K1807597-009PS  | 08/30/18 16:11 | 94    | 96    | 92     | 90     | 91     | 90     | 92     |
| K1807597-009MS  | 08/30/18 16:15 | 93    | 93    | 91     | 90     | 91     | 89     | 92     |
| K1807597-010    | 08/30/18 16:20 | 94    | 94    | 91     | 88     | 91     | 90     | 92     |
| K1807597-011    | 08/30/18 16:24 | 92    | 92    | 90     | 89     | 91     | 90     | 91     |
| K1807597-012    | 08/30/18 16:28 | 92    | 91    | 91     | 90     | 91     | 89     | 92     |
| K1807597-013    | 08/30/18 16:33 | 90    | 91    | 89     | 89     | 90     | 89     | 92     |
| K1807597-014    | 08/30/18 16:37 | 92    | 91    | 90     | 88     | 90     | 89     | 91     |
| K1807597-015    | 08/30/18 16:41 | 92    | 93    | 90     | 89     | 89     | 91     | 93     |
| ZZZZZZ          | 08/30/18 16:46 |       |       |        |        |        |        |        |
| ZZZZZZ          | 08/30/18 16:50 |       |       |        |        |        |        |        |
| K1807597-016    | 08/30/18 16:54 | 93    | 93    | 91     | 89     | 90     | 91     | 92     |
| K1807597-017    | 08/30/18 16:59 | 94    | 93    | 90     | 90     | 90     | 90     | 91     |
| K1807597-018    | 08/30/18 17:03 | 93    | 96    | 90     | 87     | 89     | 89     | 91     |
| K1807597-019    | 08/30/18 17:07 | 93    | 92    | 91     | 90     | 90     | 90     | 92     |
| ZZZZZZ          | 08/30/18 17:12 |       |       |        |        |        |        |        |
| ZZZZZZ          | 08/30/18 17:16 |       |       |        |        |        |        |        |
| ZZZZZZ          | 08/30/18 17:20 |       |       |        |        |        |        |        |
| ZZZZZZ          | 08/30/18 17:25 |       |       |        |        |        |        |        |
| ZZZZZZ          | 08/30/18 17:30 |       |       |        |        |        |        |        |
| ZZZZZZ          | 08/30/18 17:37 |       |       |        |        |        |        |        |
| ZZZZZZ          | 08/30/18 17:42 |       |       |        |        |        |        |        |
| ZZZZZZ          | 08/30/18 17:46 |       |       |        |        |        |        |        |
| ZZZZZZ          | 08/30/18 17:50 |       |       |        |        |        |        |        |
| ZZZZZZ          | 08/30/18 17:55 |       |       |        |        |        |        |        |



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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

| LuKED2 | ThKED2 |
|--------|--------|
|        |        |
|        |        |
|        |        |
|        |        |
|        |        |
| 98     | 101    |
| 96     | 101    |
| 98     | 100    |
| 97     | 100    |
|        |        |
|        |        |
| 97     | 99     |
|        |        |
| 97     | 101    |
| 97     | 100    |
| 96     | 100    |
| 96     | 99     |
| 97     | 100    |
| 96     | 98     |
| 95     | 98     |
| 97     | 100    |
|        |        |
|        |        |
| 97     | 100    |
| 96     | 100    |
| 96     | 99     |
| 97     | 99     |
|        |        |
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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument ID: K-ICP-MS-04

Analytical BatchID: 605777

| Sample          | Date/Time      | LiSTD | GeSTD | ScKED2 | GeKED3 | GeKED2 | GeKED1 | RhKED2 |
|-----------------|----------------|-------|-------|--------|--------|--------|--------|--------|
| ZZZZZZ          | 09/07/18 15:31 |       |       |        |        |        |        |        |
| ZZZZZZ          | 09/07/18 15:35 |       |       |        |        |        |        |        |
| ICV             | 09/07/18 15:39 | 101   | 100   | 99     | 98     | 98     | 100    | 98     |
| CCV             | 09/07/18 15:43 | 102   | 102   | 99     | 99     | 99     | 98     | 97     |
| ICB             | 09/07/18 15:48 | 98    | 97    | 98     | 98     | 97     | 98     | 97     |
| CCB             | 09/07/18 15:52 | 98    | 96    | 97     | 97     | 98     | 99     | 98     |
| ZZZZZZ          | 09/07/18 15:56 |       |       |        |        |        |        |        |
| LLICVW          | 09/07/18 16:00 | 102   | 100   | 98     | 98     | 97     | 99     | 97     |
| ICSA            | 09/07/18 16:04 | 86    | 87    | 90     | 82     | 83     | 83     | 81     |
| ICSAB           | 09/07/18 16:08 | 85    | 88    | 87     | 82     | 82     | 82     | 80     |
| KQ1812163-01MB  | 09/07/18 16:13 | 95    | 98    | 91     | 93     | 92     | 95     | 91     |
| KQ1812163-02LCS | 09/07/18 16:17 | 95    | 96    | 93     | 95     | 94     | 95     | 93     |
| ZZZZZZ          | 09/07/18 16:21 |       |       |        |        |        |        |        |
| K1807597-002    | 09/07/18 16:25 | 98    | 98    | 96     | 95     | 95     | 97     | 95     |
| K1807597-003    | 09/07/18 16:30 | 99    | 100   | 97     | 95     | 96     | 95     | 96     |
| K1807597-004    | 09/07/18 16:34 | 100   | 102   | 97     | 95     | 96     | 99     | 97     |
| K1807597-004DUP | 09/07/18 16:38 | 98    | 99    | 96     | 96     | 96     | 98     | 95     |
| K1807597-004SDL | 09/07/18 16:42 | 97    | 97    | 96     | 97     | 96     | 98     | 96     |
| K1807597-004PS  | 09/07/18 16:46 | 102   | 102   | 97     | 97     | 97     | 99     | 97     |
| K1807597-004MS  | 09/07/18 16:51 | 100   | 98    | 97     | 95     | 96     | 96     | 96     |
| CCV             | 09/07/18 16:55 | 102   | 101   | 97     | 96     | 96     | 97     | 97     |
| CCB             | 09/07/18 16:59 | 102   | 99    | 97     | 97     | 97     | 99     | 95     |
| K1807597-005    | 09/07/18 17:03 | 99    | 98    | 97     | 95     | 97     | 98     | 95     |
| K1807597-006    | 09/07/18 17:07 | 104   | 101   | 97     | 96     | 97     | 96     | 96     |
| K1807597-007    | 09/07/18 17:12 | 98    | 97    | 97     | 98     | 96     | 99     | 96     |
| ZZZZZZ          | 09/07/18 17:16 |       |       |        |        |        |        |        |
| ZZZZZZ          | 09/07/18 17:20 |       |       |        |        |        |        |        |
| ZZZZZZ          | 09/07/18 17:24 |       |       |        |        |        |        |        |
| ZZZZZZ          | 09/07/18 17:28 |       |       |        |        |        |        |        |
| ZZZZZZ          | 09/07/18 17:32 |       |       |        |        |        |        |        |
| ZZZZZZ          | 09/07/18 17:37 |       |       |        |        |        |        |        |
| ZZZZZZ          | 09/07/18 17:41 |       |       |        |        |        |        |        |
| CCV             | 09/07/18 17:45 | 97    | 98    | 93     | 91     | 93     | 94     | 94     |
| CCB             | 09/07/18 17:49 | 98    | 98    | 90     | 91     | 91     | 92     | 92     |
| ZZZZZZ          | 09/07/18 17:53 |       |       |        |        |        |        |        |
| LLCCVW          | 09/07/18 17:59 | 95    | 94    | 91     | 91     | 90     | 92     | 91     |
| ZZZZZZ          | 09/07/18 18:03 |       |       |        |        |        |        |        |

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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

| LuKED2 | ThKED2 |
|--------|--------|
|        |        |
|        |        |
| 98     | 99     |
| 100    | 101    |
| 97     | 98     |
| 97     | 100    |
|        |        |
| 98     | 99     |
| 92     | 93     |
| 91     | 92     |
| 94     | 96     |
| 95     | 97     |
| 96     | 97     |
| 95     | 97     |
| 95     | 98     |
| 97     | 99     |
| 95     | 97     |
| 95     | 98     |
| 98     | 99     |
| 96     | 98     |
| 97     | 99     |
| 97     | 97     |
| 96     | 99     |
| 96     | 98     |
| 97     | 97     |
|        |        |
|        |        |
|        |        |
|        |        |
|        |        |
|        |        |
|        |        |
| 94     | 97     |
| 93     | 95     |
|        |        |
| 93     | 95     |
|        |        |



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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument ID: K-ICP-MS-05

Analytical BatchID: 609313

| Sample           | Date/Time      | Sc45NG | Ge72He | Ge72H2 | In115He | Lu175He | Th232He |
|------------------|----------------|--------|--------|--------|---------|---------|---------|
| ZZZZZZ           | 10/03/18 09:04 |        |        |        |         |         |         |
| ZZZZZZ           | 10/03/18 09:07 |        |        |        |         |         |         |
| ICV              | 10/03/18 09:09 | 98     | 97     | 106    | 94      | 95      | 97      |
| CCV              | 10/03/18 09:12 | 97     | 101    | 101    | 100     | 101     | 101     |
| ICB              | 10/03/18 09:14 | 100    | 101    | 103    | 100     | 100     | 101     |
| CCB              | 10/03/18 09:17 | 99     | 99     | 102    | 99      | 99      | 99      |
| ZZZZZZ           | 10/03/18 09:20 |        |        |        |         |         |         |
| LLICVW           | 10/03/18 09:26 | 100    | 102    | 100    | 101     | 101     | 103     |
| ICSA             | 10/03/18 09:28 | 97     | 99     | 109    | 89      | 94      | 97      |
| ICSAB            | 10/03/18 09:31 | 98     | 99     | 112    | 91      | 94      | 97      |
| KQ1813873-01MB   | 10/03/18 09:39 | 104    | 101    | 104    | 102     | 101     | 103     |
| KQ1813873-02LCS  | 10/03/18 09:41 | 100    | 102    | 102    | 100     | 101     | 102     |
| KQ1813873-03DLCS | 10/03/18 09:44 | 99     | 101    | 103    | 100     | 99      | 101     |
| K1807597-020     | 10/03/18 09:46 | 98     | 98     | 103    | 101     | 100     | 100     |
| K1807597-021     | 10/03/18 09:49 | 98     | 100    | 102    | 100     | 99      | 100     |
| K1807597-022     | 10/03/18 09:51 | 100    | 101    | 102    | 101     | 99      | 100     |
| ZZZZZZ           | 10/03/18 09:54 |        |        |        |         |         |         |
| ZZZZZZ           | 10/03/18 09:56 |        |        |        |         |         |         |
| CCV              | 10/03/18 09:59 | 98     | 99     | 103    | 99      | 100     | 99      |
| ZZZZZZ           | 10/03/18 10:01 |        |        |        |         |         |         |
| CCB              | 10/03/18 10:04 | 99     | 99     | 101    | 99      | 99      | 100     |
| ZZZZZZ           | 10/03/18 10:06 |        |        |        |         |         |         |
| ZZZZZZ           | 10/03/18 10:09 |        |        |        |         |         |         |
| ZZZZZZ           | 10/03/18 10:11 |        |        |        |         |         |         |
| ZZZZZZ           | 10/03/18 10:14 |        |        |        |         |         |         |
| ZZZZZZ           | 10/03/18 10:16 |        |        |        |         |         |         |
| ZZZZZZ           | 10/03/18 10:19 |        |        |        |         |         |         |
| ZZZZZZ           | 10/03/18 10:21 |        |        |        |         |         |         |
| ZZZZZZ           | 10/03/18 10:24 |        |        |        |         |         |         |
| ZZZZZZ           | 10/03/18 10:26 |        |        |        |         |         |         |
| CCV              | 10/03/18 10:29 | 97     | 100    | 101    | 99      | 98      | 99      |
| CCB              | 10/03/18 10:33 | 98     | 99     | 101    | 100     | 101     | 101     |
| ZZZZZZ           | 10/03/18 10:37 |        |        |        |         |         |         |
| ZZZZZZ           | 10/03/18 10:40 |        |        |        |         |         |         |
| ZZZZZZ           | 10/03/18 10:42 |        |        |        |         |         |         |
| ZZZZZZ           | 10/03/18 10:45 |        |        |        |         |         |         |
| ZZZZZZ           | 10/03/18 10:47 |        |        |        |         |         |         |



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QA/QC Report

Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study/Blanks

Service Request: K1807597

ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY

Instrument ID: K-ICP-MS-05

Analytical BatchID: 609313

| Sample | Date/Time      | Sc45NG | Ge72He | Ge72H2 | In115He | Lu175He | Th232He |
|--------|----------------|--------|--------|--------|---------|---------|---------|
| ZZZZZZ | 10/03/18 10:50 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 10:52 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 10:55 |        |        |        |         |         |         |
| CCV    | 10/03/18 10:57 | 95     | 100    | 101    | 100     | 98      | 99      |
| CCB    | 10/03/18 11:01 | 100    | 100    | 101    | 101     | 100     | 101     |
| ZZZZZZ | 10/03/18 11:04 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 11:06 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 11:09 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 11:11 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 11:14 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 11:16 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 11:19 |        |        |        |         |         |         |
| CCV    | 10/03/18 11:21 | 97     | 99     | 100    | 100     | 98      | 99      |
| CCB    | 10/03/18 11:25 | 97     | 100    | 100    | 100     | 101     | 100     |
| LLCCVW | 10/03/18 11:28 | 100    | 101    | 100    | 102     | 101     | 101     |
| ZZZZZZ | 10/03/18 11:30 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 11:33 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 11:35 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 11:38 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 11:40 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 11:43 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 11:45 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 11:48 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 11:50 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 11:53 |        |        |        |         |         |         |
| CCV    | 10/03/18 11:55 | 106    | 109    | 101    | 105     | 103     | 102     |
| CCB    | 10/03/18 11:59 | 105    | 106    | 103    | 107     | 104     | 103     |
| ZZZZZZ | 10/03/18 12:01 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 12:04 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 12:06 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 12:09 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 12:11 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 12:14 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 12:16 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 12:19 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 12:21 |        |        |        |         |         |         |
| ZZZZZZ | 10/03/18 12:24 |        |        |        |         |         |         |

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QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks

**Service Request:** K1807597**ICP-MS INTERNAL STANDARDS RELATIVE INTENSITY SUMMARY****Instrument ID:** K-ICP-MS-05**Analytical BatchID:** 609313

| Sample          | Date/Time      | Sc45NG | Ge72He | Ge72H2 | In115He | Lu175He | Th232He |
|-----------------|----------------|--------|--------|--------|---------|---------|---------|
| CCV             | 10/03/18 12:27 | 102    | 103    | 100    | 103     | 101     | 102     |
| CCB             | 10/03/18 12:30 | 101    | 103    | 100    | 103     | 103     | 102     |
| ZZZZZZ          | 10/03/18 12:32 |        |        |        |         |         |         |
| CCV             | 10/03/18 12:35 | 98     | 97     | 96     | 100     | 99      | 101     |
| CCB             | 10/03/18 12:37 | 96     | 100    | 95     | 99      | 100     | 99      |
| KQ1813873-02LCS | 10/03/18 12:51 | 98     | 97     | 95     | 99      | 100     | 103     |
| CCV             | 10/03/18 12:54 | 93     | 97     | 95     | 95      | 97      | 98      |
| CCB             | 10/03/18 12:58 | 92     | 95     | 94     | 96      | 99      | 100     |
| LLCCVW          | 10/03/18 13:00 | 94     | 96     | 93     | 97      | 98      | 100     |

# Daily Performance Report

## Sample ID: Daily Performance Check

Sample Date/Time: Thursday, August 30, 2018 10:42:55

Sample Description:

Method File: C:\NexIONData\Method\CAS Daily Performance.mth

Dataset File: C:\NexIONData\DataSet\Default\Daily Performance Check.1421

MassCal File: C:\NexIONData\MassCal\Default.tun

Conditions File: C:\NexIONData\Conditions\Default.dac

Dual Detector Mode: Pulse

Acq. Dead Time (ns): 35

Current Dead Time (ns): 35

Torch Z position (mm): 0.00

## Summary

|             | Analyte | Mass  | Meas. Intens. | Mean     | Net Intens. | Mean       | Net Intens. | SD       | Net Intens. | RSD      | Mode     |
|-------------|---------|-------|---------------|----------|-------------|------------|-------------|----------|-------------|----------|----------|
| [<br>><br>] | Li      | 7.0   |               | 88885.2  |             | 88885.158  |             | 1020.021 |             | 1.1      | Standard |
|             | Be      | 9.0   |               | 18241.6  |             | 18241.641  |             | 276.526  |             | 1.5      | Standard |
|             | Mg      | 24.0  |               | 86198.7  |             | 86198.748  |             | 441.117  |             | 0.5      | Standard |
|             | Co      | 58.9  |               | 54579.2  |             | 54579.154  |             | 944.885  |             | 1.7      | Standard |
|             | In      | 114.9 |               | 89298.9  |             | 89298.946  |             | 1324.582 |             | 1.5      | Standard |
|             | Pb      | 208.0 |               | 100681.5 |             | 100681.468 |             | 928.073  |             | 0.9      | Standard |
|             | Bi      | 209.0 |               | 76498.1  |             | 76498.144  |             | 461.193  |             | 0.6      | Standard |
|             | U       | 238.1 |               | 72533.2  |             | 72533.157  |             | 849.277  |             | 1.2      | Standard |
|             | CeO     | 155.9 |               | 2051.5   |             | 0.020      |             | 0.000    |             | 1.0      | Standard |
|             | Ce      | 139.9 |               | 101409.5 |             | 101409.479 |             | 751.319  |             | 0.7      | Standard |
|             | Ce++    | 70.0  |               | 2027.7   |             | 0.020      |             | 0.000    |             | 1.5      | Standard |
| Bkgd        | 220.0   |       | 0.0           |          | 0.000       |            | 0.000       |          |             | Standard |          |

## Replicates

### Repeat 1

| Analyte | Mass | Meas. Intensity |
|---------|------|-----------------|
| Li      | 7    | 88917.865       |
| Be      | 9    | 18250.317       |
| Mg      | 24   | 86550.057       |
| Co      | 59   | 55772.659       |
| In      | 115  | 91166.639       |
| Pb      | 208  | 102130.671      |
| Bi      | 209  | 76838.089       |
| U       | 238  | 72283.075       |
| CeO     | 156  | 2066.816        |
| Ce      | 140  | 102239.884      |
| Ce++    | 70   | 2071.484        |
| Bkgd    | 220  | 0.000           |

### Repeat 2

| Analyte | Mass | Meas. Intensity |
|---------|------|-----------------|
| Li      | 7    | 89390.132       |
| Be      | 9    | 18490.626       |
| Mg      | 24   | 86601.031       |
| Co      | 59   | 55375.117       |
| In      | 115  | 89702.749       |
| Pb      | 208  | 99937.031       |
| Bi      | 209  | 75856.196       |
| U       | 238  | 72841.232       |
| CeO     | 156  | 2060.815        |
| Ce      | 140  | 101516.083      |
| Ce++    | 70   | 2064.816        |
| Bkgd    | 220  | 0.000           |

### Repeat 3

| Analyte | Mass | Meas. Intensity |
|---------|------|-----------------|
| Li      | 7    | 89700.066       |
| Be      | 9    | 18032.707       |
| Mg      | 24   | 86044.349       |
| Co      | 59   | 54269.553       |
| In      | 115  | 89404.891       |

# Daily Performance Report

## Sample ID: Daily Performance Check

Sample Date/Time: Friday, September 07, 2018 12:25:55

Sample Description:

Method File: C:\NexIONData\Method\CAS Daily Performance.mth

Dataset File: C:\NexIONData\DataSet\Default\Daily Performance Check.1460

MassCal File: C:\NexIONData\MassCal\Default.tun

Conditions File: C:\NexIONData\Conditions\Default.dac

Dual Detector Mode: Pulse

Acq. Dead Time (ns): 35

Current Dead Time (ns): 35

Torch Z position (mm): 0.00

## Summary

| Analyte | Mass  | Meas. Intens. | Mean     | Net Intens. | Mean       | Net Intens. | SD       | Net Intens. | RSD | Mode     |
|---------|-------|---------------|----------|-------------|------------|-------------|----------|-------------|-----|----------|
| Li      | 7.0   |               | 94556.9  |             | 94556.862  |             | 960.431  |             | 1.0 | Standard |
| Be      | 9.0   |               | 26328.2  |             | 26328.243  |             | 384.489  |             | 1.5 | Standard |
| Mg      | 24.0  |               | 83804.5  |             | 83804.453  |             | 977.952  |             | 1.2 | Standard |
| Co      | 58.9  |               | 66371.9  |             | 66371.857  |             | 1066.716 |             | 1.6 | Standard |
| In      | 114.9 |               | 118087.5 |             | 118087.484 |             | 1870.614 |             | 1.6 | Standard |
| Pb      | 208.0 |               | 124063.6 |             | 124063.592 |             | 1348.664 |             | 1.1 | Standard |
| Bi      | 209.0 |               | 92737.1  |             | 92737.135  |             | 1135.394 |             | 1.2 | Standard |
| U       | 238.1 |               | 88465.8  |             | 88465.763  |             | 958.210  |             | 1.1 | Standard |
| [ CeO   | 155.9 |               | 2431.4   |             | 0.020      |             | 0.001    |             | 3.6 | Standard |
| ] > Ce  | 139.9 |               | 123749.6 |             | 123749.575 |             | 1069.020 |             | 0.9 | Standard |
| [ Ce++  | 70.0  |               | 2712.4   |             | 0.022      |             | 0.001    |             | 2.7 | Standard |
| Bkgd    | 220.0 |               | 0.0      |             | 0.000      |             | 0.000    |             |     | Standard |

## Replicates

### Repeat 1

| Analyte | Mass | Meas. Intensity |
|---------|------|-----------------|
| Li      | 7    | 93639.221       |
| Be      | 9    | 26103.160       |
| Mg      | 24   | 82887.768       |
| Co      | 59   | 65110.708       |
| In      | 115  | 117219.617      |
| Pb      | 208  | 123129.638      |
| Bi      | 209  | 91784.577       |
| U       | 238  | 88088.752       |
| CeO     | 156  | 2346.859        |
| Ce      | 140  | 122766.584      |
| Ce++    | 70   | 2618.907        |
| Bkgd    | 220  | 0.000           |

### Repeat 2

| Analyte | Mass | Meas. Intensity |
|---------|------|-----------------|
| Li      | 7    | 93435.897       |
| Be      | 9    | 26155.255       |
| Mg      | 24   | 83650.863       |
| Co      | 59   | 65732.212       |
| In      | 115  | 118081.337      |
| Pb      | 208  | 124370.118      |
| Bi      | 209  | 92790.376       |
| U       | 238  | 87509.207       |
| CeO     | 156  | 2483.549        |
| Ce      | 140  | 124003.868      |
| Ce++    | 70   | 2737.596        |
| Bkgd    | 220  | 0.000           |

### Repeat 3

| Analyte | Mass | Meas. Intensity |
|---------|------|-----------------|
| Li      | 7    | 95541.756       |
| Be      | 9    | 26997.486       |
| Mg      | 24   | 85109.440       |
| Co      | 59   | 67186.286       |
| In      | 115  | 118920.253      |

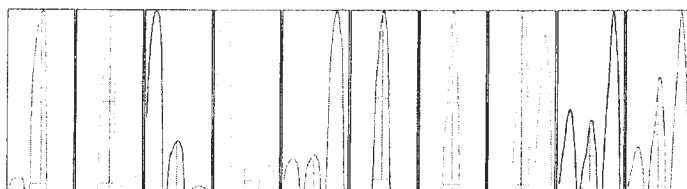
# US EPA Tune Check Sample Report

Batch Folder D:\Data\Experiments 2018\100318.b  
 Report Comment ALS Tune  
 Instrument Name G3281A JP13482848

| [No Gas] | Mass | Count  | RSD%     | RSD%       | RSD%   |
|----------|------|--------|----------|------------|--------|
|          |      | (Mean) | (Actual) | (Required) | (Flag) |
|          | 7    | 73464  | 0.57     | 5.00       |        |
|          | 9    | 17441  | 1.46     | 5.00       |        |
|          | 24   | 58986  | 0.30     | 5.00       |        |
|          | 25   | 7815   | 0.37     | 5.00       |        |
|          | 26   | 9186   | 0.58     | 5.00       |        |
|          | 59   | 87908  | 1.01     | 5.00       |        |
|          | 115  | 167566 | 0.42     | 5.00       |        |
|          | 206  | 62334  | 0.75     | 5.00       |        |
|          | 207  | 54820  | 1.31     | 5.00       |        |
|          | 208  | 134257 | 0.89     | 5.00       |        |

| Mass | Replicate 1 | Replicate 2 | Replicate 3 | Replicate 4 | Replicate 5 |
|------|-------------|-------------|-------------|-------------|-------------|
|      | Count       | Count       | Count       | Count       | Count       |
| 7    | 73484       | 73347       | 73638       | 72852       | 73999       |
| 9    | 17833       | 17568       | 17243       | 17285       | 17275       |
| 24   | 59211       | 58873       | 58846       | 59151       | 58848       |
| 25   | 7834        | 7829        | 7833        | 7765        | 7817        |
| 26   | 9252        | 9185        | 9103        | 9187        | 9202        |
| 59   | 89403       | 87850       | 87374       | 87792       | 87119       |
| 115  | 167489      | 168730      | 167405      | 166860      | 167344      |
| 206  | 62912       | 62730       | 61834       | 62226       | 61969       |
| 207  | 55822       | 54896       | 53812       | 54636       | 54931       |
| 208  | 135156      | 135808      | 133928      | 132961      | 133432      |

Integration Time [sec] = 0.1



| Mass | Peak   | Axis     | Axis          | Axis   | Width-X% | Width-X%   | Width-X% |
|------|--------|----------|---------------|--------|----------|------------|----------|
|      | Height | (Actual) | (Required)    | (Flag) | (Actual) | (Required) | (Flag)   |
| 7    | 11919  | 7.05     | 6.9 - 7.1     |        | 0.744    | 0.900      |          |
| 9    | 2958   | 9.05     | 8.9 - 9.1     |        | 0.784    | 0.900      |          |
| 24   | 9510   | 23.95    | 23.9 - 24.1   |        | 0.788    | 0.900      |          |
| 25   | 1269   | 24.95    | 24.9 - 25.1   |        | 0.793    | 0.900      |          |
| 26   | 1453   | 25.95    | 25.9 - 26.1   |        | 0.767    | 0.900      |          |
| 59   | 15174  | 58.95    | 58.9 - 59.1   |        | 0.800    | 0.900      |          |
| 115  | 32785  | 115.00   | 114.9 - 115.1 |        | 0.767    | 0.900      |          |
| 206  | 12256  | 206.00   | 205.9 - 206.1 |        | 0.818    | 0.900      |          |
| 207  | 10711  | 207.00   | 206.9 - 207.1 |        | 0.783    | 0.900      |          |
| 208  | 26453  | 208.00   | 207.9 - 208.1 |        | 0.782    | 0.900      |          |

X# = 5 Integration Time [sec] = 0.1 Acquisition Time [sec] = 234.5 Y Axis = Linear

## Tune Parameters

### ## Plasma Parameters ##

| ParameterName | Value | Unit | ParameterName  | Value | Unit  | ParameterName | Value | Unit |
|---------------|-------|------|----------------|-------|-------|---------------|-------|------|
| RF Power      | 1600  | W    | Carrier Gas    | 0.57  | L/min |               |       |      |
| RF Matching   | 1.76  | V    | Option Gas     | 0.0   | %     |               |       |      |
| Smpl Depth    | 8.0   | mm   | Nebulizer Pump | 0.10  | rpm   |               |       |      |
| S/C Temp      | 2     | °C   |                |       |       |               |       |      |

### ## Lenses Parameters ##

| ParameterName | Value  | Unit | ParameterName | Value | Unit | ParameterName | Value | Unit |
|---------------|--------|------|---------------|-------|------|---------------|-------|------|
| Extract 1     | 0.0    | V    | Omega Lens    | 8.5   | V    |               |       |      |
| Extract 2     | -155.0 | V    | Cell Entrance | -30   | V    |               |       |      |
| Omega Bias    | -85    | V    | Cell Exit     | -50   | V    |               |       |      |
| Deflect       | 12.0   | V    |               |       |      |               |       |      |

### ## Cell Parameters ##

| ParameterName         | Value | Unit   | ParameterName | Value | Unit | ParameterName | Value | Unit |
|-----------------------|-------|--------|---------------|-------|------|---------------|-------|------|
| Use Gas               | false |        | 3rd Gas Flow  | 0     | %    |               |       |      |
| He Flow               | 0.0   | mL/min | OctP Bias     | -8.0  | V    |               |       |      |
| H2 Flow               | 0.0   | mL/min | OctP RF       | 200   | V    |               |       |      |
| Energy Discrimination | 5.0   | V      |               |       |      |               |       |      |



Standard number 2 applied. [1.0]

Correlation Coef.: 0.999540 Slope: 0.02642 Intercept: 0.00000

Sequence No.: 4

Autosampler Location: 4

Sample ID: Std 2.5

Date Collected: 8/28/2018 10:58:39 AM

Analyst:

Data Type: Original

## Replicate Data: Std 2.5

| Repl # | SampleConc ug/L | StdConc ug/L | Blncorr Signal | Peak Area | Peak Height | Bkgnd Area | Bkgnd Height | Time     | Peak Stored |
|--------|-----------------|--------------|----------------|-----------|-------------|------------|--------------|----------|-------------|
| 1      |                 | [2.5]        | 0.066          | 0.263     | 0.069       |            |              | 10:59:01 | Yes         |
| 2      |                 | [2.5]        | 0.066          | 0.281     | 0.068       |            |              | 10:59:35 | Yes         |
| 3      |                 | [2.5]        | 0.067          | 0.272     | 0.069       |            |              | 11:00:08 | Yes         |
| Mean:  |                 | [2.5]        | 0.067          |           |             |            |              |          |             |
| SD:    |                 | 0.0          | 0.0004         |           |             |            |              |          |             |
| %RSD:  |                 | 0.0          | 0.53           |           |             |            |              |          |             |

Standard number 3 applied. [2.5]

Correlation Coef.: 0.999962 Slope: 0.02657 Intercept: 0.00000

Sequence No.: 5

Autosampler Location: 5

Sample ID: Std 4.0

Date Collected: 8/28/2018 11:00:58 AM

Analyst:

Data Type: Original

## Replicate Data: Std 4.0

| Repl # | SampleConc ug/L | StdConc ug/L | Blncorr Signal | Peak Area | Peak Height | Bkgnd Area | Bkgnd Height | Time     | Peak Stored |
|--------|-----------------|--------------|----------------|-----------|-------------|------------|--------------|----------|-------------|
| 1      |                 | [4.0]        | 0.106          | 0.452     | 0.108       |            |              | 11:01:21 | Yes         |
| 2      |                 | [4.0]        | 0.105          | 0.440     | 0.107       |            |              | 11:01:55 | Yes         |
| 3      |                 | [4.0]        | 0.107          | 0.441     | 0.109       |            |              | 11:02:29 | Yes         |
| Mean:  |                 | [4.0]        | 0.106          |           |             |            |              |          |             |
| SD:    |                 | 0.0          | 0.0010         |           |             |            |              |          |             |
| %RSD:  |                 | 0.0          | 0.98           |           |             |            |              |          |             |

Standard number 4 applied. [4.0]

Correlation Coef.: 0.999989 Slope: 0.02655 Intercept: 0.00000

Sequence No.: 6

Autosampler Location: 6

Sample ID: Std 8.0

Date Collected: 8/28/2018 11:03:19 AM

Analyst:

Data Type: Original

## Replicate Data: Std 8.0

| Repl # | SampleConc ug/L | StdConc ug/L | Blncorr Signal | Peak Area | Peak Height | Bkgnd Area | Bkgnd Height | Time     | Peak Stored |
|--------|-----------------|--------------|----------------|-----------|-------------|------------|--------------|----------|-------------|
| 1      |                 | [8.0]        | 0.206          | 0.844     | 0.208       |            |              | 11:03:43 | Yes         |
| 2      |                 | [8.0]        | 0.204          | 0.859     | 0.206       |            |              | 11:04:16 | Yes         |
| 3      |                 | [8.0]        | 0.202          | 0.850     | 0.204       |            |              | 11:04:50 | Yes         |
| Mean:  |                 | [8.0]        | 0.204          |           |             |            |              |          |             |
| SD:    |                 | 0.0          | 0.0022         |           |             |            |              |          |             |
| %RSD:  |                 | 0.0          | 1.10           |           |             |            |              |          |             |

Standard number 5 applied. [8.0]

Correlation Coef.: 0.999590 Slope: 0.02578 Intercept: 0.00000

\*

Calibration data for Se 196.03

Equation: Linear Through Zero

| ID      | Mean Signal (Abs) | Entered Conc. ug/L | Calculated Conc. ug/L | Standard Deviation | %RSD |
|---------|-------------------|--------------------|-----------------------|--------------------|------|
| Cal Blk | 0.0000            | 0                  | 0.000                 | 0.00               | 27.2 |
| Std 0.5 | 0.0135 ✓          | 0.5                | 0.522                 | 0.00               | 3.0  |
| Std 1.0 | 0.0263 ✓          | 1.0                | 1.020                 | 0.00               | 0.5  |
| Std 2.5 | 0.0665 ✓          | 2.5                | 2.580                 | 0.00               | 0.5  |
| Std 4.0 | 0.1062 ✓          | 4.0                | 4.118                 | 0.00               | 1.0  |

Std 8.0      0.2038      8.0      7.908      0.00      1.1  
Correlation Coef.: 0.999590      Slope: 0.02578      Intercept: 0.00000

Sequence No.: 7      Autosampler Location: 7  
Sample ID: ICV      Date Collected: 8/28/2018 11:05:42 AM  
Analyst:      Data Type: Original

## Replicate Data: ICV

| Repl # | SampleConc ug/L | StdndConc ug/L | BlndCorr Signal | Peak Area | Peak Height | Bkgnd Area | Bkgnd Height | Time     | Peak Stored |
|--------|-----------------|----------------|-----------------|-----------|-------------|------------|--------------|----------|-------------|
| 1      | 4.171           | 4.171          | 0.108           | 0.440     | 0.110       |            |              | 11:06:05 | Yes         |
| 2      | 4.088           | 4.088          | 0.105           | 0.436     | 0.107       |            |              | 11:06:39 | Yes         |
| 3      | 4.158           | 4.158          | 0.107           | 0.442     | 0.109       |            |              | 11:07:13 | Yes         |
| Mean:  | 4.139           | 4.139          | 0.107           |           |             |            |              |          |             |
| SD:    | 0.045           | 0.045          | 0.0011          |           |             |            |              |          |             |
| %RSD:  | 1.076           | 1.076          | 1.08            |           |             |            |              |          |             |

QC value within limits for Se 196.03 Recovery = 103.48%  
All analyte(s) passed QC.

Sequence No.: 8      Autosampler Location: 1  
Sample ID: ICB      Date Collected: 8/28/2018 11:08:04 AM  
Analyst:      Data Type: Original

## Replicate Data: ICB

| Repl # | SampleConc ug/L | StdndConc ug/L | BlndCorr Signal | Peak Area | Peak Height | Bkgnd Area | Bkgnd Height | Time     | Peak Stored |
|--------|-----------------|----------------|-----------------|-----------|-------------|------------|--------------|----------|-------------|
| 1      | -0.015          | -0.015         | -0.000          | 0.000     | 0.002       |            |              | 11:08:25 | Yes         |
| 2      | 0.037           | 0.037          | 0.001           | 0.008     | 0.003       |            |              | 11:08:59 | Yes         |
| 3      | -0.014          | -0.014         | -0.000          | 0.002     | 0.002       |            |              | 11:09:33 | Yes         |
| Mean:  | 0.002           | 0.002          | 0.000           |           |             |            |              |          |             |
| SD:    | 0.030           | 0.030          | 0.0008          |           |             |            |              |          |             |
| %RSD:  | >999.9%         | >999.9%        | >999.9%         |           |             |            |              |          |             |

QC value within limits for Se 196.03 Recovery = Not calculated  
All analyte(s) passed QC.

Sequence No.: 9      Autosampler Location: 2  
Sample ID: LLICV      Date Collected: 8/28/2018 11:10:21 AM  
Analyst:      Data Type: Original

## Replicate Data: LLICV

| Repl # | SampleConc ug/L | StdndConc ug/L | BlndCorr Signal | Peak Area | Peak Height | Bkgnd Area | Bkgnd Height | Time     | Peak Stored |
|--------|-----------------|----------------|-----------------|-----------|-------------|------------|--------------|----------|-------------|
| 1      | 0.475           | 0.475          | 0.012           | 0.053     | 0.014       |            |              | 11:10:42 | Yes         |
| 2      | 0.499           | 0.499          | 0.013           | 0.060     | 0.015       |            |              | 11:11:16 | Yes         |
| 3      | 0.494           | 0.494          | 0.013           | 0.053     | 0.015       |            |              | 11:11:50 | Yes         |
| Mean:  | 0.490           | 0.490          | 0.013           |           |             |            |              |          |             |
| SD:    | 0.012           | 0.012          | 0.0003          |           |             |            |              |          |             |
| %RSD:  | 2.536           | 2.536          | 2.54            |           |             |            |              |          |             |

QC value within limits for Se 196.03 Recovery = 97.91%  
All analyte(s) passed QC.

Sequence No.: 10      Autosampler Location: 5  
Sample ID: CCV      Date Collected: 8/28/2018 11:12:39 AM  
Analyst:      Data Type: Original

## Replicate Data: CCV

| Repl # | SampleConc ug/L | StdndConc ug/L | BlndCorr Signal | Peak Area | Peak Height | Bkgnd Area | Bkgnd Height | Time     | Peak Stored |
|--------|-----------------|----------------|-----------------|-----------|-------------|------------|--------------|----------|-------------|
| 1      | 4.079           | 4.079          | 0.105           | 0.447     | 0.107       |            |              | 11:13:02 | Yes         |

**ALS Environmental  
FAA Run Log**

Page 1

|                     |                            |
|---------------------|----------------------------|
| <b>Method: 7742</b> | <b>Service Request # :</b> |
|---------------------|----------------------------|

**Analysis for: Se**

**DATA**

| <b>SAMPLE<br/>NUMBER</b> | <b>Dilution<br/>Factor</b> | <b>Measured<br/>(µg/L)</b> | <b>Recoveries<br/>(ICV, CCV, CRA, LCS,<br/>Matrix Spk.)</b> | <b>Comments</b>      |
|--------------------------|----------------------------|----------------------------|-------------------------------------------------------------|----------------------|
|                          |                            |                            |                                                             | Post Spike = 2.5 ppb |
| Cal. Blk                 | -                          | 0.000                      |                                                             |                      |
| Cal. Std 0.5             | -                          | 0.500                      | *(0.025-50ml)                                               | *Cal. Std = AA1-24-H |
| Cal. Std 1.0             | -                          | 1.000                      | *(0.05-50ml)                                                |                      |
| Cal. Std 2.5             | -                          | 2.500                      | *(0.125-50ml)                                               |                      |
| Cal. Std 4.0             | -                          | 4.000                      | *(0.200-50ml)                                               |                      |
| Cal. Std 8.0             | -                          | 8.000                      | *(0.400-50ml)                                               |                      |
| ICV                      | -                          | 4.139 ✓                    | 103%                                                        | ICV Std = AA1-25-1   |
| ICB                      | -                          | 0.002                      |                                                             |                      |
| LLICV                    | -                          | 0.490 ✓                    | 98%                                                         |                      |
| CCV                      | -                          | 4.090 ✓                    | 102%                                                        |                      |
| CCB                      | -                          | -0.012                     |                                                             |                      |
| KQ1811639-05 2X          | 1/2                        | 0.275                      |                                                             |                      |
| KQ1811402-01 2X          | 1/2                        | 0.004                      |                                                             |                      |
| KQ1811402-02 2X          | 1/2                        | 5.062 ✓                    | 101%                                                        |                      |
| K1807597-001 2X          | 1/2                        | 0.012                      |                                                             |                      |
| K1807597-001A 2X         | 1/2                        | 2.604 ✓                    | 104%                                                        |                      |
| KQ1811402-03 2X          | 1/2                        | -0.004                     |                                                             |                      |
| KQ1811402-04 4X          | 1/2 x 1/2                  | 3.945 ✓                    | 99%                                                         |                      |
| K1807597-002 2X          | 1/2                        | 0.012                      |                                                             |                      |
| K1807597-003 2X          | 1/2                        | 0.014                      |                                                             |                      |
| K1807597-004 2X          | 1/2                        | -0.023                     |                                                             |                      |
| CCV                      | -                          | 3.986 ✓                    | 100%                                                        |                      |
| CCB                      | -                          | -0.009                     |                                                             |                      |
| K1807597-005 2X          | 1/2                        | -0.016                     |                                                             |                      |
| K1807597-006 2X          | 1/2                        | -0.032                     |                                                             |                      |
| K1807597-007 2X          | 1/2                        | -0.015                     |                                                             |                      |
| KQ1811639-01 2X          | 1/2                        | -0.004                     |                                                             |                      |
| KQ1811639-02 2X          | 1/2                        | 5.010 ✓                    | 100%                                                        |                      |
| K1807597-010 2X          | 1/2                        | 0.022                      |                                                             |                      |
| K1807597-010A 2X         | 1/2                        | 2.660 ✓                    | 106%                                                        |                      |
| KQ1811639-03 2X          | 1/2                        | 0.013                      |                                                             |                      |
| KQ1811639-04 4X          | 1/2 x 1/2                  | 3.950 ✓                    | 99%                                                         |                      |

**Comments:**

|                               |                 |                    |                            |                   |
|-------------------------------|-----------------|--------------------|----------------------------|-------------------|
| <b>True Values/QC Limits:</b> | <b>LCSW</b>     | <b>Water Spike</b> | <b>LCSS (ERA D099-540)</b> | <b>Soil Spike</b> |
| Arsenic:                      | 10ppb (80-120%) | 16ppb (75-125%)    | 171mg/kg (113-209)         | 40ppb (75-125%)   |
| Selenium                      | 10ppb (80-120%) | 16ppb (75-125%)    | 206mg/kg (131-252)         | 40ppb (75-125%)   |

Cx = MSA Corrected Concentration (as per method)

ALS Environmental  
FAA Run Log

| Analysis for: Se  |                    | DATA               |                                                    |  |                                      |
|-------------------|--------------------|--------------------|----------------------------------------------------|--|--------------------------------------|
| SAMPLE<br>NUMBER  | Dilution<br>Factor | Measured<br>(µg/L) | Recoveries<br>(ICV, CCV, CRA, LCS,<br>Matrix Spk.) |  | Comments<br><br>Post Spike = 2.5 ppb |
| K1807597-008 2X   | 1/2                | 0.039              |                                                    |  |                                      |
| CCV               | -                  | 4.196 ✓            | 105%                                               |  |                                      |
| CCB               | -                  | -0.017             |                                                    |  |                                      |
| K1807597-009 2X   | 1/2                | 0.008              |                                                    |  |                                      |
| K1807597-011 2X   | 1/2                | -0.033             |                                                    |  |                                      |
| K1807597-012 2X   | 1/2                | 0.022              |                                                    |  |                                      |
| K1807597-013 2X   | 1/2                | 0.008              |                                                    |  |                                      |
| K1807597-014 2X   | 1/2                | 0.019              |                                                    |  |                                      |
| K1807597-015 2X   | 1/2                | 0.008              |                                                    |  |                                      |
| K1807597-016 2X   | 1/2                | 0.005              |                                                    |  |                                      |
| K1807597-017 2X   | 1/2                | -0.018             |                                                    |  |                                      |
| K1807597-018 2X   | 1/2                | -0.005             |                                                    |  |                                      |
| K1807597-019 2X   | 1/2                | -0.009             |                                                    |  |                                      |
| CCV               | -                  | 3.964 ✓            | 99%                                                |  |                                      |
| CCB               | -                  | 0.002              |                                                    |  |                                      |
| KQ1811793-01 10X  | 1/10               | -0.020             |                                                    |  |                                      |
| KQ1811793-02 500X | 1/10 x 1/50        | 5.052              | 101%                                               |  |                                      |
| K1807782-001 10X  | 1/10               | 0.049              |                                                    |  |                                      |
| K1807782-001A 10X | 1/10               | 2.481              | 99%                                                |  |                                      |
| KQ1811793-03 10X  | 1/10               | 0.026              |                                                    |  |                                      |
| KQ1811793-04 200X | 1/10 x 1/20        | 4.991              | 100%                                               |  |                                      |
| K1807782-002 10X  | 1/10               | 0.156              |                                                    |  |                                      |
| K1807840-001 10X  | 1/10               | 0.013              |                                                    |  |                                      |
| K1807840-002 10X  | 1/10               | 0.359              |                                                    |  |                                      |
| K1808023-001 10 X | 1/10               | 0.006              |                                                    |  |                                      |
| CCV               | -                  | 4.047              | 101%                                               |  |                                      |
| CCB               | -                  | 0.001              |                                                    |  |                                      |
| K1808023-002 10X  | 1/10               | 0.163              |                                                    |  |                                      |
| CCV               | -                  | 4.123              | 103%                                               |  |                                      |
| CCB               | -                  | 0.070              |                                                    |  |                                      |
|                   |                    |                    |                                                    |  |                                      |
|                   |                    |                    |                                                    |  |                                      |
| Comments:         |                    |                    |                                                    |  |                                      |

## Hydride Secondary Prep.

[illegible]

Time Started: 0850 8/28/18

Time Finished: 0920 8/28/18

Pipet ID: U72101, OU72101, U85104 Calibration Due: 10/06/18

50mL Centrifuge Tube Lot: P7233490

HNO3 Lot: 185596

HCl Lot:185016

Hot Block Digester: K-Block Digester-08

Position: 29

Thermometer ID: 664416

Temperature: 50.0°C

Correction Factor: 0.0°C

Analyst:

Date:

# Hydride Secondary Prep.

| Sample       | Initial Volume (mL) | Final Volume (mL) | Matrix                        |
|--------------|---------------------|-------------------|-------------------------------|
| BLANK        | 0.0                 | 50                | 3% HNO <sub>3</sub> , 40% HCl |
| 0.5 ppb      | 0.025 AA1-24-H      | 50                | 3% HNO <sub>3</sub> , 40% HCl |
| 1.0 ppb      | 0.050 AA1-24-H      | 50                | 3% HNO <sub>3</sub> , 40% HCl |
| 2.5 ppb      | 0.125 AA1-24-H      | 50                | 3% HNO <sub>3</sub> , 40% HCl |
| 4.0 ppb      | 0.200 AA1-24-H      | 50                | 3% HNO <sub>3</sub> , 40% HCl |
| 8.0 ppb      | 0.400 AA1-24-H      | 50                | 3% HNO <sub>3</sub> , 40% HCl |
| ICV          | 0.200 AA1-25-I      | 50                | 3% HNO <sub>3</sub> , 40% HCl |
| KQ1811639-01 | 15                  | 30                | 3% HNO <sub>3</sub> , 40% HCl |
| KQ1811639-02 | 15                  | 30                | 3% HNO <sub>3</sub> , 40% HCl |
| KQ1811639-03 | 15                  | 30                | 3% HNO <sub>3</sub> , 40% HCl |
| KQ1811639-04 | 15                  | 30                | 3% HNO <sub>3</sub> , 40% HCl |
| KQ1811639-05 | 15                  | 30                | 3% HNO <sub>3</sub> , 40% HCl |
| K1807597-008 | 15                  | 30                | 3% HNO <sub>3</sub> , 40% HCl |
| K1807597-009 | 15                  | 30                | 3% HNO <sub>3</sub> , 40% HCl |
| K1807597-010 | 15                  | 30                | 3% HNO <sub>3</sub> , 40% HCl |
| K1807597-011 | 15                  | 30                | 3% HNO <sub>3</sub> , 40% HCl |
| K1807597-012 | 15                  | 30                | 3% HNO <sub>3</sub> , 40% HCl |
| K1807597-013 | 15                  | 30                | 3% HNO <sub>3</sub> , 40% HCl |
| K1807597-014 | 15                  | 30                | 3% HNO <sub>3</sub> , 40% HCl |
| K1807597-015 | 15                  | 30                | 3% HNO <sub>3</sub> , 40% HCl |
| K1807597-016 | 15                  | 30                | 3% HNO <sub>3</sub> , 40% HCl |
| K1807597-017 | 15                  | 30                | 3% HNO <sub>3</sub> , 40% HCl |
| K1807597-018 | 15                  | 30                | 3% HNO <sub>3</sub> , 40% HCl |
| K1807597-019 | 15                  | 30                | 3% HNO <sub>3</sub> , 40% HCl |
| 3C 8/28/18   |                     |                   |                               |
|              |                     |                   |                               |
|              |                     |                   |                               |
|              |                     |                   |                               |
|              |                     |                   |                               |
|              |                     |                   |                               |
|              |                     |                   |                               |
|              |                     |                   |                               |
|              |                     |                   |                               |
|              |                     |                   |                               |

Time Started: 0850 8/28/18

Time Finished: 0920 8/28/18

Pipet ID: U72101, OU72101, U85104 Calibration Due: 10/06/18

50mL Centrifuge Tube Lot: P7233490

HNO<sub>3</sub> Lot: 185596

HCl Lot: 185016

Hot Block Digester: K-Block Digester-08

Position: 29

Thermometer ID: 664416

Temperature: 50.0°C

Correction Factor: 0.0°C

|             |               |
|-------------|---------------|
| Analyst: 3C | Date: 8/28/18 |
|-------------|---------------|

Standard number 2 applied. [1.0]

Correlation Coef.: 0.999690 Slope: 0.02639 Intercept: 0.00000

Sequence No.: 4

Autosampler Location: 4

Sample ID: Std 2.5

Date Collected: 10/3/2018 11:15:26 AM

Analyst:

Data Type: Original

Replicate Data: Std 2.5

| Repl # | SampleConc ug/L | StdConc ug/L | BlkCorr Signal | Peak Area | Peak Height | Bkgnd Area | Bkgnd Height | Time     | Peak Stored |
|--------|-----------------|--------------|----------------|-----------|-------------|------------|--------------|----------|-------------|
| 1      |                 | [2.5]        | 0.067          | 0.270     | 0.069       |            |              | 11:15:48 | Yes         |
| 2      |                 | [2.5]        | 0.066          | 0.268     | 0.068       |            |              | 11:16:22 | Yes         |
| 3      |                 | [2.5]        | 0.066          | 0.277     | 0.068       |            |              | 11:16:56 | Yes         |
| Mean:  |                 | [2.5]        | 0.066          |           |             |            |              |          |             |
| SD:    |                 | 0.0          | 0.0004         |           |             |            |              |          |             |
| %RSD:  |                 | 0.0          | 0.54           |           |             |            |              |          |             |

Standard number 3 applied. [2.5]

Correlation Coef.: 0.999979 Slope: 0.02647 Intercept: 0.00000

Sequence No.: 5

Autosampler Location: 5

Sample ID: Std 4.0

Date Collected: 10/3/2018 11:17:46 AM

Analyst:

Data Type: Original

Replicate Data: Std 4.0

| Repl # | SampleConc ug/L | StdConc ug/L | BlkCorr Signal | Peak Area | Peak Height | Bkgnd Area | Bkgnd Height | Time     | Peak Stored |
|--------|-----------------|--------------|----------------|-----------|-------------|------------|--------------|----------|-------------|
| 1      |                 | [4.0]        | 0.104          | 0.432     | 0.106       |            |              | 11:18:09 | Yes         |
| 2      |                 | [4.0]        | 0.104          | 0.430     | 0.106       |            |              | 11:18:43 | Yes         |
| 3      |                 | [4.0]        | 0.103          | 0.423     | 0.105       |            |              | 11:19:17 | Yes         |
| Mean:  |                 | [4.0]        | 0.104          |           |             |            |              |          |             |
| SD:    |                 | 0.0          | 0.0004         |           |             |            |              |          |             |
| %RSD:  |                 | 0.0          | 0.37           |           |             |            |              |          |             |

Standard number 4 applied. [4.0]

Correlation Coef.: 0.999847 Slope: 0.02611 Intercept: 0.00000

Sequence No.: 6

Autosampler Location: 6

Sample ID: Std 8.0

Date Collected: 10/3/2018 11:20:07 AM

Analyst:

Data Type: Original

Replicate Data: Std 8.0

| Repl # | SampleConc ug/L | StdConc ug/L | BlkCorr Signal | Peak Area | Peak Height | Bkgnd Area | Bkgnd Height | Time     | Peak Stored |
|--------|-----------------|--------------|----------------|-----------|-------------|------------|--------------|----------|-------------|
| 1      |                 | [8.0]        | 0.203          | 0.842     | 0.205       |            |              | 11:20:31 | Yes         |
| 2      |                 | [8.0]        | 0.198          | 0.821     | 0.200       |            |              | 11:21:04 | Yes         |
| 3      |                 | [8.0]        | 0.199          | 0.826     | 0.201       |            |              | 11:21:38 | Yes         |
| Mean:  |                 | [8.0]        | 0.200          |           |             |            |              |          |             |
| SD:    |                 | 0.0          | 0.0025         |           |             |            |              |          |             |
| %RSD:  |                 | 0.0          | 1.26           |           |             |            |              |          |             |

Standard number 5 applied. [8.0]

Correlation Coef.: 0.999510 Slope: 0.02530 Intercept: 0.00000



Calibration data for Se 196.03

Equation: Linear Through Zero

| ID      | Mean Signal (Abs) | Entered Conc. ug/L | Calculated Conc. ug/L | Standard Deviation | %RSD |
|---------|-------------------|--------------------|-----------------------|--------------------|------|
| Cal Blk | 0.0000            | 0                  | 0.000                 | 0.00               | 8.2  |
| Std 0.5 | 0.0130 ✓          | 0.5                | 0.513                 | 0.00               | 4.5  |
| Std 1.0 | 0.0265 ✓          | 1.0                | 1.047                 | 0.00               | 2.0  |
| Std 2.5 | 0.0662 ✓          | 2.5                | 2.617                 | 0.00               | 0.5  |
| Std 4.0 | 0.1037 ✓          | 4.0                | 4.100                 | 0.00               | 0.4  |

Std 8.0      0.1999 ✓      8.0      7.902      0.00      1.3  
Correlation Coef.: 0.999510 / Slope: 0.02530 / Intercept: 0.00000

Sequence No.: 7      Autosampler Location: 7  
Sample ID: ICV      Date Collected: 10/3/2018 11:22:29 AM  
Analyst:      Data Type: Original

## Replicate Data: ICV

| Repl # | SampleConc ug/L | StdndConc ug/L | BlndCorr Signal | Peak Area | Peak Height | Bkgnd Area | Bkgnd Height | Time     | Peak Stored |
|--------|-----------------|----------------|-----------------|-----------|-------------|------------|--------------|----------|-------------|
| 1      | 4.127           | 4.127          | 0.104           | 0.435     | 0.106       |            |              | 11:22:53 | Yes         |
| 2      | 4.227           | 4.227          | 0.107           | 0.441     | 0.109       |            |              | 11:23:27 | Yes         |
| 3      | 4.131           | 4.131          | 0.105           | 0.427     | 0.107       |            |              | 11:24:01 | Yes         |
| Mean:  | 4.162           | 4.162          | 0.105           |           |             |            |              |          |             |
| SD:    | 0.057           | 0.057          | 0.0014          |           |             |            |              |          |             |
| %RSD:  | 1.360           | 1.360          | 1.36            |           |             |            |              |          |             |

QC value within limits for Se 196.03 Recovery = 104.04%  
All analyte(s) passed QC.

Sequence No.: 8      Autosampler Location: 1  
Sample ID: ICB      Date Collected: 10/3/2018 11:24:53 AM  
Analyst:      Data Type: Original

## Replicate Data: ICB

| Repl # | SampleConc ug/L | StdndConc ug/L | BlndCorr Signal | Peak Area | Peak Height | Bkgnd Area | Bkgnd Height | Time     | Peak Stored |
|--------|-----------------|----------------|-----------------|-----------|-------------|------------|--------------|----------|-------------|
| 1      | 0.005           | 0.005          | 0.000           | -0.001    | 0.002       |            |              | 11:25:14 | Yes         |
| 2      | 0.008           | 0.008          | 0.000           | 0.004     | 0.002       |            |              | 11:25:48 | Yes         |
| 3      | 0.032           | 0.032          | 0.001           | 0.011     | 0.003       |            |              | 11:26:22 | Yes         |
| Mean:  | 0.015           | 0.015          | 0.000           |           |             |            |              |          |             |
| SD:    | 0.015           | 0.015          | 0.0004          |           |             |            |              |          |             |
| %RSD:  | 97.69           | 97.69          | 97.69           |           |             |            |              |          |             |

QC value within limits for Se 196.03 Recovery = Not calculated  
All analyte(s) passed QC.

Sequence No.: 9      Autosampler Location: 2  
Sample ID: LLICV      Date Collected: 10/3/2018 11:27:10 AM  
Analyst:      Data Type: Original

## Replicate Data: LLICV

| Repl # | SampleConc ug/L | StdndConc ug/L | BlndCorr Signal | Peak Area | Peak Height | Bkgnd Area | Bkgnd Height | Time     | Peak Stored |
|--------|-----------------|----------------|-----------------|-----------|-------------|------------|--------------|----------|-------------|
| 1      | 0.559           | 0.559          | 0.014           | 0.063     | 0.016       |            |              | 11:27:32 | Yes         |
| 2      | 0.517           | 0.517          | 0.013           | 0.059     | 0.015       |            |              | 11:28:05 | Yes         |
| 3      | 0.509           | 0.509          | 0.013           | 0.056     | 0.015       |            |              | 11:28:39 | Yes         |
| Mean:  | 0.528           | 0.528          | 0.013           |           |             |            |              |          |             |
| SD:    | 0.027           | 0.027          | 0.0007          |           |             |            |              |          |             |
| %RSD:  | 5.083           | 5.083          | 5.08            |           |             |            |              |          |             |

QC value within limits for Se 196.03 Recovery = 105.66%  
All analyte(s) passed QC.

Sequence No.: 10      Autosampler Location: 5  
Sample ID: CCV      Date Collected: 10/3/2018 11:29:29 AM  
Analyst:      Data Type: Original

## Replicate Data: CCV

| Repl # | SampleConc ug/L | StdndConc ug/L | BlndCorr Signal | Peak Area | Peak Height | Bkgnd Area | Bkgnd Height | Time     | Peak Stored |
|--------|-----------------|----------------|-----------------|-----------|-------------|------------|--------------|----------|-------------|
| 1      | 4.064           | 4.064          | 0.103           | 0.433     | 0.105       |            |              | 11:29:52 | Yes         |



ALS Environmental  
FAA Run Log

|                                                                                          |                                  |
|------------------------------------------------------------------------------------------|----------------------------------|
| <b>Method:</b> (Circle Method Used)<br>742 7062<br>Other: _____<br>Element: As <u>Se</u> | <b>Service Request # :</b> _____ |
|------------------------------------------------------------------------------------------|----------------------------------|

| SAMPLE<br>NUMBER | Dilution<br>Factor | Measured<br>(µg/L) | Recoveries<br>(ICV, CCV, CRA, LCS,<br>Matrix Spk.) | Comments             |
|------------------|--------------------|--------------------|----------------------------------------------------|----------------------|
| Cal. Blk         | -                  | 0.000              |                                                    | Post Spike = 2.5 ppb |
| Cal. Std 0.5     | -                  | 0.500              | *(0.025-50ml)                                      | *Cal. Std = AA1-24-H |
| Cal. Std 1.0     | -                  | 1.000              | *(0.05-50ml)                                       |                      |
| Cal. Std 2.5     | -                  | 2.500              | *(0.125-50ml)                                      |                      |
| Cal. Std 4.0     | -                  | 4.000              | *(0.200-50ml)                                      |                      |
| Cal. Std 8.0     | -                  | 8.000              | *(0.400-50ml)                                      |                      |
| ICV              | -                  | 4.162 ✓            | 104%                                               | ICV Std = AA1-25-I   |
| ICB              | -                  | 0.015              |                                                    |                      |
| LLICV            | -                  | 0.528 ✓            | 106%                                               |                      |
| CCV              | -                  | 4.140 ✓            | 104%                                               |                      |
| CCB              | -                  | 0.011              |                                                    |                      |
| KQ1813872-01 2X  | 1/2                | -0.018             |                                                    |                      |
| KQ1813872-02 2X  | 1/2                | 4.517 ✓            | 90%                                                |                      |
| KQ1813872-03 2X  | 1/2                | 4.552 ✓            | 91%                                                |                      |
| K1807597-020 2X  | 1/2                | 0.037              |                                                    |                      |
| K1807597-020A 2X | 1/2                | 2.551 ✓            | 102%                                               |                      |
| K1807597-021 2X  | 1/2                | 0.009              |                                                    |                      |
| K1807597-022 2X  | 1/2                | 0.009              |                                                    |                      |
| KQ1813806-01 2X  | 1/2                | 0.031              |                                                    |                      |
| KQ1813806-02 2X  | 1/2                | 4.646              | 93%                                                |                      |
| K1809013-002 2X  | 1/2                | 0.051              |                                                    |                      |
| CCV              | -                  | 4.053 ✓            | 101%                                               |                      |
| CCB              | -                  | 0.009              |                                                    |                      |
| K1809013-002A 2X | 1/2                | 2.669              | 107%                                               |                      |
| KQ1813806-03 2X  | 1/2                | 0.082              |                                                    |                      |
| KQ1813806-04 4X  | 1/2 x 1/2          | 3.794              | 95%                                                |                      |
| K1809013-001 2X  | 1/2                | 0.083              |                                                    |                      |
| K1809013-003 2X  | 1/2                | 0.038              |                                                    |                      |
| K1809013-004 2X  | 1/2                | 0.051              |                                                    |                      |
| K1809013-005 2X  | 1/2                | 0.028              |                                                    |                      |

|                                                  |                 |                 |                     |                 |
|--------------------------------------------------|-----------------|-----------------|---------------------|-----------------|
| <b>True Values/QC Limits:</b>                    | LCSW            | Water Spike     | LCSS (ERA D099-540) | Soil Spike      |
| Arsenic:                                         | 10ppb (80-120%) | 16ppb (75-125%) | 171mg/kg (113-209)  | 40ppb (75-125%) |
| Selenium                                         | 10ppb (80-120%) | 16ppb (75-125%) | 206mg/kg (131-252)  | 40ppb (75-125%) |
| Cx = MSA Corrected Concentration (as per method) |                 |                 |                     |                 |

|                                                                                   |                                                                                        |                                                                                       |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Analyst</b><br><br><div style="text-align: center; font-size: 1.5em;">3C</div> | <b>Date:</b><br><br><div style="text-align: center; font-size: 1.5em;">10/3/18 ✓</div> | <b>Page Number:</b><br><br><div style="text-align: center; font-size: 1.5em;">1</div> |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|

**ALS Environmental  
FAA Run Log**

|                                                                                     |                            |
|-------------------------------------------------------------------------------------|----------------------------|
| <b>Method:</b> (Circle Method Used)<br>7742 7062<br>Other:<br>Element: <u>As Se</u> | <b>Service Request # :</b> |
|-------------------------------------------------------------------------------------|----------------------------|

| SAMPLE<br>NUMBER  | Dilution<br>Factor | Measured<br>(µg/L) | Recoveries<br>(ICV, CCV, CRA, LCS,<br>Matrix Spk.) |  | Comments<br><br>Post Spike = 2.5 ppb |
|-------------------|--------------------|--------------------|----------------------------------------------------|--|--------------------------------------|
| K1809013-006 2X   | 1/2                | 0.057              |                                                    |  |                                      |
| K1809013-007 2X   | 1/2                | 0.027              |                                                    |  |                                      |
| K1809013-008 2X   | 1/2                | 0.065              |                                                    |  |                                      |
| CCV               | -                  | 4.081              | 102%                                               |  |                                      |
| CCB               | -                  | 0.995              | 3C 10/3/18                                         |  | See rerun                            |
| CCB               | -                  | -0.014             |                                                    |  |                                      |
| K1809013-009 2X   | 1/2                | 0.053              |                                                    |  |                                      |
| K1809013-010 2X   | 1/2                | 0.037              |                                                    |  |                                      |
| K1809013-011 2X   | 1/2                | 0.055              |                                                    |  |                                      |
| K1809013-012 2X   | 1/2                | 0.113              |                                                    |  |                                      |
| K1809013-013 2X   | 1/2                | 0.053              |                                                    |  |                                      |
| K1809013-014 2X   | 1/2                | 0.077              |                                                    |  |                                      |
| K1809013-015 2X   | 1/2                | 0.251              |                                                    |  |                                      |
| K1809013-016 2X   | 1/2                | 0.048              |                                                    |  |                                      |
| KQ1813861-01 10X  | 1/10               | 0.049              |                                                    |  |                                      |
| KQ1813861-02 500X | 1/10 x 1/50        | 5.002              | 100%                                               |  |                                      |
| CCV               | -                  | 4.078              | 102%                                               |  |                                      |
| CCB               | -                  | 0.651              | 3C 10/3/18                                         |  | See rerun                            |
| CCB               | -                  | -0.004             |                                                    |  |                                      |
| K1809085-001 10X  | 1/10               | 0.053              |                                                    |  |                                      |
| K1809085-001A 10X | 1/10               | 2.573              | 103%                                               |  |                                      |
| KQ1813861-03 10X  | 1/10               | 0.032              |                                                    |  |                                      |
| KQ1813861-04 200X | 1/10 x 1/20        | 4.887              | 98%                                                |  |                                      |
| K1809085-002 10X  | 1/10               | 0.769              |                                                    |  |                                      |
| K1809466-001 10X  | 1/10               | 0.026              |                                                    |  |                                      |
| K1809466-002 10X  | 1/10               | 0.066              |                                                    |  |                                      |
| CCV               | -                  | 4.112              | 103%                                               |  |                                      |
| CCB               | -                  | -0.013             |                                                    |  |                                      |
|                   |                    |                    |                                                    |  |                                      |
|                   |                    |                    |                                                    |  |                                      |

|                                                  |                 |                 |                     |                 |
|--------------------------------------------------|-----------------|-----------------|---------------------|-----------------|
| <b>True Values/QC Limits:</b>                    | LCSW            | Water Spike     | LCSS (ERA D099-540) | Soil Spike      |
| Arsenic:                                         | 10ppb (80-120%) | 16ppb (75-125%) | 171mg/kg (113-209)  | 40ppb (75-125%) |
| Selenium                                         | 10ppb (80-120%) | 16ppb (75-125%) | 206mg/kg (131-252)  | 40ppb (75-125%) |
| Cx = MSA Corrected Concentration (as per method) |                 |                 |                     |                 |

|                          |                             |                              |
|--------------------------|-----------------------------|------------------------------|
| <b>Analyst</b><br><br>3C | <b>Date:</b><br><br>10/3/18 | <b>Page Number:</b><br><br>2 |
|--------------------------|-----------------------------|------------------------------|

## Hydride Secondary Prep.

[illegible]

Time Started: 0910 10/3/18

Time Finished: 0940 10/3/18

Pipet ID: U72101, OU72101, U85104 Calibration Due: 10/06/18

50mL Centrifuge Tube Lot: P7265114

HNO3 Lot: 191695

HCl Lot:196610

Hot Block Digester: K-Block Digester-16

Position: 36

Thermometer ID: 661752

Temperature: 50.0°C

Correction Factor: 0.0°C

**Analyst:**

Date:

## Preparation Information Benchsheet

**Prep Run:** 320198      **Prep Workflow:** MetDigAqICP      **Status:** Prepped      **Prep Date:** 08/22/2018 16:55 ✓  
**Team:** Metals      **Prep Method:** METALS      **Current Step:** Digestion      **Due Date:** 09/04/2018  
**Analyst:** JHINSON      **ILM04.0**      **Hold Date:** 02/02/2019  
**Rush/NPDES:** N/A

| Lab Code                      | Client ID                     | Bottle # | Initial Amt | Final Volume | Spike Amt                                         | Spike ID                                       | TestNo List | Comments      |
|-------------------------------|-------------------------------|----------|-------------|--------------|---------------------------------------------------|------------------------------------------------|-------------|---------------|
| KQ1811403-02                  | Method Blank                  |          | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO3, 5%HCl |
| KQ1811403-01                  | Lab Control Sample            |          | 10 mL       | 10.5 mL      | 0.02 mL<br>0.05 mL<br>0.05 mL<br>0.1 mL<br>0.1 mL | 180013<br>184062<br>184064<br>191144<br>191959 | Metals T    | 1%HNO3, 5%HCl |
| K1807597-001                  | Rinsate Blank                 | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO3, 5%HCl |
| K1807597-002                  | Rinsate Blank K1807185        | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO3, 5%HCl |
| K1807597-002:<br>KQ1811403-03 | Duplicate                     | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO3, 5%HCl |
| K1807597-002:<br>KQ1811403-04 | Matrix Spike                  | .01      | 10 mL       | 11.0 mL      | 0.1 mL<br>0.1 mL<br>0.1 mL<br>0.1 mL<br>0.1 mL    | 191045<br>191144<br>191777<br>191813<br>191959 | Metals T    | 1%HNO3, 5%HCl |
| K1807597-003                  | Homogenization Blank K1807185 | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO3, 5%HCl |
| K1807597-004                  | Homogenization Blank K1807185 | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO3, 5%HCl |
| K1807597-005                  | Rinsate Blank K1807185        | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO3, 5%HCl |
| K1807597-006                  | Homogenization Blank K1807185 | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO3, 5%HCl |
| K1807597-007                  | Homogenization Blank K1807185 | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO3, 5%HCl |

11 Total Samples consisting of 7 Client Samples, 2 Client QC Samples, 2 Batch QC Samples associated with the current Prep Run.

## Spiking Solutions

| Name                   | Type  | ID     | Expires   | Name                | Type  | ID     | Expires    |
|------------------------|-------|--------|-----------|---------------------|-------|--------|------------|
| Antimony 1000 ug/mL Sb | Spike | 180013 | 9/14/2018 | K-MET SS3           | Spike | 191777 | 2/27/2019  |
| K-MET QCP-CICV-1       | Spike | 184062 | 9/15/2018 | K-MET SS4           | Spike | 191959 | 11/10/2018 |
| K-MET QCP-CICV-3       | Spike | 184064 | 9/15/2018 | K-MET SS5           | Spike | 191045 | 10/18/2018 |
| K-MET SS1              | Spike | 191813 | 9/14/2018 | Sulfur 1000 ug/mL S | Spike | 191144 | 12/31/2019 |

## Preparation Materials

| Step      | Name             | ID     | Step      | Name       | ID     |
|-----------|------------------|--------|-----------|------------|--------|
| Digestion | K-MET HCL        | 189025 | Digestion | K-MET HNO3 | 192004 |
| Digestion | K-MET 16 mL Tube | 191911 |           |            |        |

## Preparation Hardware / Equipment

| Step      | Name             | Property              | Value | Step      | Name               | Property              | Value |
|-----------|------------------|-----------------------|-------|-----------|--------------------|-----------------------|-------|
| Digestion | K- CR 20-200     |                       |       | Digestion | K-BlockDigester-18 | Thermometer ID 663052 | NONE  |
| Digestion | K-BlockDigester- | Corrected Temperature | 95    |           |                    |                       |       |

|           |                    |                      |    |       |           |                    |                      |    |      |
|-----------|--------------------|----------------------|----|-------|-----------|--------------------|----------------------|----|------|
|           | 18                 |                      |    |       | Digestion | K-BlockDigester-18 | Thermometer Location | 76 | NONE |
| Digestion | K-BlockDigester-18 | Correction Factor    | 0  | deg C | Digestion | K-CR 100A          |                      |    |      |
| Digestion | K-BlockDigester-18 | Observed Temperature | 95 | deg C | Digestion | K-CR 50            |                      |    |      |

**Preparation Steps**

| <u>Step</u> | <u>Started</u>     | <u>Finished</u>    | <u>By</u> | <u>Assisted By</u> | <u>Training?</u> | <u>Comments</u> |
|-------------|--------------------|--------------------|-----------|--------------------|------------------|-----------------|
| Digestion   | 22-AUG-18<br>16:55 | 22-AUG-18<br>18:55 | JHINSON   |                    | N                |                 |

**Comments**

Post spike added.

**Review**Reviewed by: SP Date: 8/24/18

## Preparation Information Benchsheet

**Prep Run:** 320502      **Prep Workflow:** MetDigAqICP      **Status:** Prepped  
**Team:** Metals      **Prep Method:** METALS      **Current Step:** Digestion      **Prep Date:** 08/27/2018 16:29 ✓  
**Analyst:** JHINSON      **ILM04.0**      **Due Date:** 09/06/2018  
**Rush/NPDES:** N/A      **Hold Date:** 02/13/2019

| Lab Code                      | Client ID                     | Bottle # | Initial Amt | Final Volume | Spike Amt                                         | Spike ID                                       | TestNo List | Comments                   |
|-------------------------------|-------------------------------|----------|-------------|--------------|---------------------------------------------------|------------------------------------------------|-------------|----------------------------|
| KQ1811637-02                  | Method Blank                  |          | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO <sub>3</sub> , 5%HCl |
| KQ1811637-01                  | Lab Control Sample            |          | 10 mL       | 10.8 mL      | 0.02 mL<br>0.05 mL<br>0.05 mL<br>0.1 mL<br>0.1 mL | 180013<br>184062<br>184064<br>191144<br>191959 | Metals T    | 1%HNO <sub>3</sub> , 5%HCl |
| K1807597-008                  | Rinsate Blank K1807185        | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO <sub>3</sub> , 5%HCl |
| K1807597-008:<br>KQ1811637-03 | Duplicate                     | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO <sub>3</sub> , 5%HCl |
| K1807597-008:<br>KQ1811637-04 | Matrix Spike                  | .01      | 10 mL       | 11.0 mL      | 0.1 mL<br>0.1 mL<br>0.1 mL<br>0.1 mL<br>0.1 mL    | 191144<br>191777<br>191813<br>191959<br>191977 | Metals T    | 1%HNO <sub>3</sub> , 5%HCl |
| K1807597-009                  | Homogenization Blank K1807185 | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO <sub>3</sub> , 5%HCl |
| K1807597-010                  | Homogenization Blank K1807185 | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO <sub>3</sub> , 5%HCl |
| K1807597-011                  | Rinsate Blank K1807189        | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO <sub>3</sub> , 5%HCl |
| K1807597-012                  | Homogenization Blank K1807189 | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO <sub>3</sub> , 5%HCl |
| K1807597-013                  | Homogenization Blank K1807189 | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO <sub>3</sub> , 5%HCl |
| K1807597-014                  | Rinsate Blank K1807189        | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO <sub>3</sub> , 5%HCl |
| K1807597-015                  | Homogenization Blank K1807189 | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO <sub>3</sub> , 5%HCl |
| K1807597-016                  | Homogenization Blank K1807189 | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO <sub>3</sub> , 5%HCl |
| K1807597-017                  | Rinsate Blank K1807189        | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO <sub>3</sub> , 5%HCl |
| K1807597-018                  | Homogenization Blank K1807189 | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO <sub>3</sub> , 5%HCl |
| K1807597-019                  | Homogenization Blank K1807189 | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T    | 1%HNO <sub>3</sub> , 5%HCl |

16 Total Samples consisting of 12 Client Samples, 2 Client QC Samples, 2 Batch QC Samples associated with the current Prep Run.

## Spiking Solutions

| Name                   | Type  | ID     | Expires   | Name                | Type  | ID     | Expires    |
|------------------------|-------|--------|-----------|---------------------|-------|--------|------------|
| Antimony 1000 ug/mL Sb | Spike | 180013 | 9/14/2018 | K-MET SS3           | Spike | 191777 | 2/27/2019  |
| K-MET QCP-CICV-1       | Spike | 184062 | 9/15/2018 | K-MET SS4           | Spike | 191959 | 11/10/2018 |
| K-MET QCP-CICV-3       | Spike | 184064 | 9/15/2018 | K-MET SS5           | Spike | 191977 | 10/18/2018 |
| K-MET SS1              | Spike | 191813 | 9/14/2018 | Sulfur 1000 ug/mL S | Spike | 191144 | 12/31/2019 |

**Preparation Materials**

| Step      | Name             | ID     | Step      | Name       | ID     |
|-----------|------------------|--------|-----------|------------|--------|
| Digestion | K-MET HCL        | 189025 | Digestion | K-MET HNO3 | 192004 |
| Digestion | K-MET 16 mL Tube | 191911 |           |            |        |

**Preparation Hardware / Equipment**

| Step      | Name               | Property              | Value |       | Step      | Name               | Property              | Value |      |
|-----------|--------------------|-----------------------|-------|-------|-----------|--------------------|-----------------------|-------|------|
| Digestion | K- CR 20-200       |                       |       |       | Digestion | K-BlockDigester-18 | Thermometer ID 663052 |       | NONE |
| Digestion | K-BlockDigester-18 | Corrected Temperature | 95    | deg C | Digestion | K-BlockDigester-18 | Thermometer Location  | 79    | NONE |
| Digestion | K-BlockDigester-18 | Correction Factor     | 0     | deg C | Digestion | K-CR 100A          |                       |       |      |
| Digestion | K-BlockDigester-18 | Observed Temperature  | 95    | deg C | Digestion | K-CR 50            |                       |       |      |

**Preparation Steps**

| Step      | Started         | Finished        | By      | Assisted By | Training? | Comments |
|-----------|-----------------|-----------------|---------|-------------|-----------|----------|
| Digestion | 27-AUG-18 16:29 | 27-AUG-18 18:29 | JHINSON |             | N         |          |

**Comments**

Post spike added.

**Review**Reviewed by: JP Date: 8/28/18

## Preparation Information Benchsheet

**Prep Run:** 323133      **Prep Workflow:** MetDigAqICP      **Status:** Prepped  
**Team:** Metals      **Prep Method:** EPA CLP-      **Current Step:** Digestion  
**Analyst:** JHINSON      **ILM04.0**  
**Rush/NPDES:** N/A

**Prep Date:** 10/02/2018 12:39  
**Due Date:** 09/07/2018  
**Hold Date:** 01/30/2019

| Lab Code     | Client ID                               | Bottle # | Initial Amt | Final Volume | Spike Amt                                         | Spike ID                                       | Test No List | Comments                     |
|--------------|-----------------------------------------|----------|-------------|--------------|---------------------------------------------------|------------------------------------------------|--------------|------------------------------|
| KQ1813871-03 | Method Blank                            |          | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T     | 1% HNO <sub>3</sub> , 5% HCl |
| KQ1813871-01 | Lab Control Sample                      |          | 10 mL       | 10.8 mL      | 0.1 mL<br>0.05 mL<br>0.05 mL<br>0.02 mL<br>0.1 mL | 191144<br>191870<br>191871<br>191920<br>191959 | Metals T     | 1% HNO <sub>3</sub> , 5% HCl |
| KQ1813871-02 | Duplicate Lab Control Sample            |          | 10 mL       | 10.8 mL      | 0.1 mL<br>0.05 mL<br>0.05 mL<br>0.02 mL<br>0.1 mL | 191144<br>191870<br>191871<br>191920<br>191959 | Metals T     | 1% HNO <sub>3</sub> , 5% HCl |
| K1807597-020 | Rinsate Blank-Northern Pike 8/03        | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T     | 1% HNO <sub>3</sub> , 5% HCl |
| K1807597-021 | Homogenization Blank-Northern Pike 8/03 | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T     | 1% HNO <sub>3</sub> , 5% HCl |
| K1807597-022 | Homogenization Blank-Northern Pike 8/03 | .01      | 10 mL       | 10.5 mL      |                                                   |                                                | Metals T     | 1% HNO <sub>3</sub> , 5% HCl |

6 Total Samples consisting of 3 Client Samples, 0 Client QC Samples, 3 Batch QC Samples associated with the current Prep Run.

## Spiking Solutions

| Name                   | Type  | ID     | Expires   | Name                | Type  | ID     | Expires    |
|------------------------|-------|--------|-----------|---------------------|-------|--------|------------|
| Antimony 1000 ug/mL Sb | Spike | 191920 | 1/31/2020 | K-MET SS4           | Spike | 191959 | 11/10/2018 |
| K-MET QCP-CICV-1       | Spike | 191870 | 7/20/2019 | Sulfur 1000 ug/mL S | Spike | 191144 | 12/31/2019 |
| K-MET QCP-CICV-3       | Spike | 191871 | 7/20/2019 |                     |       |        |            |

## Preparation Materials

| Step      | Name             | ID     | Step      | Name                   | ID     |
|-----------|------------------|--------|-----------|------------------------|--------|
| Digestion | K-MET HCL        | 189025 | Digestion | K-MET HNO <sub>3</sub> | 192004 |
| Digestion | K-MET 16 mL Tube | 191911 |           |                        |        |

## Preparation Hardware / Equipment

| Step      | Name               | Property              | Value | Step      | Name               | Property              | Value |
|-----------|--------------------|-----------------------|-------|-----------|--------------------|-----------------------|-------|
| Digestion | K- CR 20-200       |                       |       | Digestion | K-BlockDigester-18 | Thermometer ID 663052 | NONE  |
| Digestion | K-BlockDigester-18 | Corrected Temperature | 95    | Digestion | K-BlockDigester-18 | Thermometer Location  | 100   |
| Digestion | K-BlockDigester-18 | Correction Factor     | 0     | Digestion | K-CR 100A          |                       |       |
| Digestion | K-BlockDigester-18 | Observed Temperature  | 95    | Digestion | K-CR 50            |                       |       |

## Preparation Steps

| Step      | Started         | Finished        | By      | Assisted By | Training? | Comments |
|-----------|-----------------|-----------------|---------|-------------|-----------|----------|
| Digestion | 02-OCT-18 12:39 | 02-OCT-18 14:39 | JHINSON |             | N         |          |



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**Comments**

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**Review**

Reviewed by:       Zp       Date: 10/3/18

## Preparation Information Benchsheet

**Prep Run:** 321145      **Prep Workflow:** MetDigAqMS      **Status:** Prepped      **Prep Date:** 09/04/2018 ✓  
**Team:** Metals      **Prep Method:** EPA CLP-      **Current Step:** Digestion      **Due Date:** 09/04/2018  
**Analyst:** JHINSON      **ILM04.0**      **Hold Date:** 02/02/2019  
**Rush/NPDES:** N/A

| Lab Code                      | Client ID                     | Bottle # | Initial Amt | Final Volume | Spike Amt                             | Spike ID                             | TestNo List | Comments                       |
|-------------------------------|-------------------------------|----------|-------------|--------------|---------------------------------------|--------------------------------------|-------------|--------------------------------|
| KQ1812163-01                  | Method Blank                  |          | 10 mL       | 10 mL        |                                       |                                      | Metals T    | 1% HNO <sub>3</sub> , 0.2% HCl |
| KQ1812163-02                  | Lab Control Sample            |          | 10 mL       | 10.3 mL      | 0.1 mL<br>0.1 mL<br>0.02 mL<br>0.1 mL | 184106<br>184108<br>188524<br>192003 | Metals T    | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-001                  | Rinsate Blank                 | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T    | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-002                  | Rinsate Blank K1807185        | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T    | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-003                  | Homogenization Blank K1807185 | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T    | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-004                  | Homogenization Blank K1807185 | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T    | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-004:<br>KQ1812163-03 | Duplicate                     | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T    | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-004:<br>KQ1812163-04 | Matrix Spike                  | .01      | 10 mL       | 10.3 mL      | 0.1 mL<br>0.1 mL<br>0.02 mL<br>0.1 mL | 184106<br>184108<br>188524<br>192003 | Metals T    | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-005                  | Rinsate Blank K1807185        | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T    | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-006                  | Homogenization Blank K1807185 | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T    | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-007                  | Homogenization Blank K1807185 | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T    | 1% HNO <sub>3</sub> , 0.2% HCl |

11 Total Samples consisting of 7 Client Samples, 2 Client QC Samples, 2 Batch QC Samples associated with the current Prep Run.

## Spiking Solutions

| Name                   | Type  | ID     | Expires   | Name                   | Type  | ID     | Expires   |
|------------------------|-------|--------|-----------|------------------------|-------|--------|-----------|
| K-MET Mo/U 10ppm       | Spike | 188524 | 11/3/2018 | k-met 1/100 QCP-CICV-3 | Spike | 184108 | 9/15/2018 |
| k-met 1/100 QCP CICV-1 | Spike | 184106 | 9/15/2018 | k-met Sb 1ug/mL Sb     | Spike | 192003 | 6/18/2019 |

## Preparation Materials

| Step      | Name             | ID     | Step      | Name                   | ID     |
|-----------|------------------|--------|-----------|------------------------|--------|
| Digestion | K-MET HCl ULTREX | 184998 | Digestion | K-MET HNO <sub>3</sub> | 192004 |
| Digestion | K-MET 16 mL Tube | 191911 |           |                        |        |

## Preparation Hardware / Equipment

| Step      | Name               | Property              | Value | Step      | Name               | Property              | Value |
|-----------|--------------------|-----------------------|-------|-----------|--------------------|-----------------------|-------|
| Digestion | K- CR 20-200       |                       |       | Digestion | K-BlockDigester-18 | Thermometer ID 663052 | NONE  |
| Digestion | K-BlockDigester-18 | Corrected Temperature | 95    | Digestion | K-BlockDigester-18 | Thermometer Location  | 83    |
| Digestion | K-BlockDigester-18 | Correction Factor     | 0     | Digestion | K-CR 100A          |                       |       |
|           | K-                 |                       |       |           |                    |                       |       |

|           |                  |                      |    |       |
|-----------|------------------|----------------------|----|-------|
| Digestion | BlockDigester-18 | Observed Temperature | 95 | deg C |
|-----------|------------------|----------------------|----|-------|

**Preparation Steps**

| <u>Step</u> | <u>Started</u>     | <u>Finished</u>    | <u>By</u> | <u>Assisted By</u> | <u>Training?</u> | <u>Comments</u> |
|-------------|--------------------|--------------------|-----------|--------------------|------------------|-----------------|
| Digestion   | 04-SEP-18<br>11:36 | 04-SEP-18<br>13:36 | JHINSON   |                    | N                |                 |

**Comments**

Post spike added. Redigest: RPD out of limits.

**Review**

Reviewed by: \_\_\_\_\_

Date: \_\_\_\_\_

 9/4/18

## Preparation Information Benchsheet

**Prep Run:** 320503      **Prep Workflow:** MetDigAqMS      **Status:** Prepped      **Prep Date:** 08/27/2018 16:29 ✓  
**Team:** Metals      **Prep Method:** EPA CLP- METALS      **Current Step:** Digestion  
**Analyst:** JHINSON      **Rush/NPDES:** N/A      **Due Date:** 09/06/2018  
**Hold Date:** 02/13/2019

| Lab Code                      | Client ID                     | Bottle # | Initial Amt | Final Volume | Spike Amt                             | Spike ID                             | Test No List | Comments                       |
|-------------------------------|-------------------------------|----------|-------------|--------------|---------------------------------------|--------------------------------------|--------------|--------------------------------|
| KQ1811638-01                  | Method Blank                  |          | 10 mL       | 10 mL        |                                       |                                      | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl |
| KQ1811638-02                  | Lab Control Sample            |          | 10 mL       | 10.3 mL      | 0.1 mL<br>0.1 mL<br>0.02 mL<br>0.1 mL | 184106<br>184108<br>188524<br>192003 | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-008                  | Rinsate Blank K1807185        | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-009                  | Homogenization Blank K1807185 | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-009:<br>KQ1811638-03 | Duplicate                     | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-009:<br>KQ1811638-04 | Matrix Spike                  | .01      | 10 mL       | 10.3 mL      | 0.1 mL<br>0.1 mL<br>0.02 mL<br>0.1 mL | 184106<br>184108<br>188524<br>192003 | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-010                  | Homogenization Blank K1807185 | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-011                  | Rinsate Blank K1807189        | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-012                  | Homogenization Blank K1807189 | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-013                  | Homogenization Blank K1807189 | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-014                  | Rinsate Blank K1807189        | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-015                  | Homogenization Blank K1807189 | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-016                  | Homogenization Blank K1807189 | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-017                  | Rinsate Blank K1807189        | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-018                  | Homogenization Blank K1807189 | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl |
| K1807597-019                  | Homogenization Blank K1807189 | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl |

16 Total Samples consisting of 12 Client Samples, 2 Client QC Samples, 2 Batch QC Samples associated with the current Prep Run.

## Spiking Solutions

| Name                   | Type  | ID     | Expires   | Name                   | Type  | ID     | Expires   |
|------------------------|-------|--------|-----------|------------------------|-------|--------|-----------|
| K-MET Mo/U 10ppm       | Spike | 188524 | 11/3/2018 | k-met 1/100 QCP-CICV-3 | Spike | 184108 | 9/15/2018 |
| k-met 1/100 QCP CICV-1 | Spike | 184106 | 9/15/2018 | k-met Sb 1ug/mL Sb     | Spike | 192003 | 6/18/2019 |

## Preparation Materials

| Step      | Name             | ID     | Step      | Name                   | ID     |
|-----------|------------------|--------|-----------|------------------------|--------|
| Digestion | K-MET HCl ULTREX | 184998 | Digestion | K-MET HNO <sub>3</sub> | 192004 |
| Digestion | K-MET 16 mL Tube | 191911 |           |                        |        |

**Preparation Hardware / Equipment**

| Step      | Name               | Property              | Value |       | Step      | Name               | Property              | Value |      |
|-----------|--------------------|-----------------------|-------|-------|-----------|--------------------|-----------------------|-------|------|
| Digestion | K- CR 20-200       |                       |       |       | Digestion | K-BlockDigester-18 | Thermometer ID 663052 |       | NONE |
| Digestion | K-BlockDigester-18 | Corrected Temperature | 95    | deg C | Digestion | K-BlockDigester-18 | Thermometer Location  | 79    | NONE |
| Digestion | K-BlockDigester-18 | Correction Factor     | 0     | deg C | Digestion | K-CR 100A          |                       |       |      |
| Digestion | K-BlockDigester-18 | Observed Temperature  | 95    | deg C |           |                    |                       |       |      |

**Preparation Steps**

| <u>Step</u> | <u>Started</u>     | <u>Finished</u>    | <u>By</u> | <u>Assisted By</u> | <u>Training?</u> | <u>Comments</u> |
|-------------|--------------------|--------------------|-----------|--------------------|------------------|-----------------|
| Digestion   | 27-AUG-18<br>16:29 | 27-AUG-18<br>18:29 | JHINSON   |                    | N                |                 |

**Comments**

Post spike added.

**Review**Reviewed by: EQ Date: 8/28/18

## Preparation Information Benchsheet

**Prep Run:** 323136    **Prep Workflow:** MetDigAqMS    **Status:** Prepped    **Prep Date:** 10/02/2018 12:39 ✓  
**Team:** Metals    **Prep Method:** EPA CLP-METALS    **Current Step:** Digestion  
**Analyst:** JHINSON    **Rush/NPDES:** N/A    **Due Date:** 09/07/2018  
**Hold Date:** 01/30/2019

| Lab Code     | Client ID                               | Bottle # | Initial Amt | Final Volume | Spike Amt                             | Spike ID                             | Test No List | Comments                                    |
|--------------|-----------------------------------------|----------|-------------|--------------|---------------------------------------|--------------------------------------|--------------|---------------------------------------------|
| KQ1813873-01 | Method Blank                            |          | 10 mL       | 10 mL        |                                       |                                      | Metals T     | 1% H <sub>2</sub> O <sub>2</sub> , 0.2% HCl |
| KQ1813873-02 | Lab Control Sample                      |          | 10 mL       | 10.3 mL      | 0.02 mL<br>0.1 mL<br>0.1 mL<br>0.1 mL | 188524<br>192003<br>193248<br>193249 | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl              |
| KQ1813873-03 | Duplicate Lab Control Sample            |          | 10 mL       | 10.3 mL      | 0.02 mL<br>0.1 mL<br>0.1 mL<br>0.1 mL | 188524<br>192003<br>193248<br>193249 | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl              |
| K1807597-020 | Rinse Blank-Northern Pike 8/03          | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T     | 1% H <sub>2</sub> O <sub>2</sub> , 0.2% HCl |
| K1807597-021 | Homogenization Blank-Northern Pike 8/03 | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl              |
| K1807597-022 | Homogenization Blank-Northern Pike 8/03 | .01      | 10 mL       | 10 mL        |                                       |                                      | Metals T     | 1% HNO <sub>3</sub> , 0.2% HCl              |

6 Total Samples consisting of 3 Client Samples, 0 Client QC Samples, 3 Batch QC Samples associated with the current Prep Run.

## Spiking Solutions

| Name                   | Type  | ID     | Expires   | Name                   | Type  | ID     | Expires   |
|------------------------|-------|--------|-----------|------------------------|-------|--------|-----------|
| K-MET Mo/U 10ppm       | Spike | 188524 | 11/3/2018 | k-met 1/100 QCP-CICV-3 | Spike | 193248 | 7/20/2019 |
| k-met 1/100 QCP CICV-1 | Spike | 193249 | 7/20/2019 | k-met Sb 1ug/mL Sb     | Spike | 192003 | 6/18/2019 |

## Preparation Materials

| Step      | Name             | ID     | Step      | Name                   | ID     |
|-----------|------------------|--------|-----------|------------------------|--------|
| Digestion | K-MET HCl ULTREX | 184998 | Digestion | K-MET HNO <sub>3</sub> | 192004 |
| Digestion | K-MET 16 mL Tube | 191911 |           |                        |        |

## Preparation Hardware / Equipment

| Step      | Name               | Property              | Value |       | Step      | Name               | Property              | Value |      |
|-----------|--------------------|-----------------------|-------|-------|-----------|--------------------|-----------------------|-------|------|
| Digestion | K- CR 20-200       |                       |       |       | Digestion | K-BlockDigester-18 | Thermometer ID 663052 |       | NONE |
| Digestion | K-BlockDigester-18 | Corrected Temperature | 95    | deg C | Digestion | K-BlockDigester-18 | Thermometer Location  | 100   | NONE |
| Digestion | K-BlockDigester-18 | Correction Factor     | 0     | deg C | Digestion | K-CR 100A          |                       |       |      |
| Digestion | K-BlockDigester-18 | Observed Temperature  | 95    | deg C |           |                    |                       |       |      |

## Preparation Steps

| Step      | Started         | Finished        | By      | Assisted By | Training? | Comments |
|-----------|-----------------|-----------------|---------|-------------|-----------|----------|
| Digestion | 02-OCT-18 12:39 | 02-OCT-18 14:39 | JHINSON |             | N         |          |

## Comments

## Review

Reviewed by: JH Date: 10/3/18

## Preparation Information Benchsheet

**Prep Run:** 320197    **Prep Workflow:** MetDigAqICP    **Status:** Prepped    **Prep Date:** 08/23/2018  
**Team:** Metals    **Prep Method:** EPA 3010A    **Current Step:** Digestion    09:10  
**Analyst:** JHINSON    **Rush/NPDES:** N/A    **Due Date:** 09/04/2018  
**Hold Date:** 02/02/2019

| Lab Code                      | Client ID                     | Bottle # | Initial Amt | Final Volume | Spike Amt | Spike ID | TestNo Liv | Comments                     |
|-------------------------------|-------------------------------|----------|-------------|--------------|-----------|----------|------------|------------------------------|
| KQ1811402-01                  | Method Blank                  |          | 25 mL       | 25 mL        |           |          | Se T       | 6% HNO <sub>3</sub> , 5% HCl |
| KQ1811402-02                  | Lab Control Sample            |          | 25 mL       | 25 mL        | 0.1 mL    | 187741   | Se T       | 6% HNO <sub>3</sub> , 5% HCl |
| K1807597-001                  | Rinsate Blank                 | .01      | 25 mL       | 25 mL        |           |          | Se T       | 6% HNO <sub>3</sub> , 5% HCl |
| K1807597-001:<br>KQ1811402-03 | Duplicate                     | .01      | 25 mL       | 25 mL        |           |          | Se T       | 6% HNO <sub>3</sub> , 5% HCl |
| K1807597-001:<br>KQ1811402-04 | Matrix Spike                  | .01      | 25 mL       | 25 mL        | 0.1 mL    | 190897   | Se T       | 6% HNO <sub>3</sub> , 5% HCl |
| K1807597-002                  | Rinsate Blank K1807185        | .01      | 25 mL       | 25 mL        |           |          | Se T       | 6% HNO <sub>3</sub> , 5% HCl |
| K1807597-003                  | Homogenization Blank K1807185 | .01      | 25 mL       | 25 mL        |           |          | Se T       | 6% HNO <sub>3</sub> , 5% HCl |
| K1807597-004                  | Homogenization Blank K1807185 | .01      | 25 mL       | 25 mL        |           |          | Se T       | 6% HNO <sub>3</sub> , 5% HCl |
| K1807597-005                  | Rinsate Blank K1807185        | .01      | 25 mL       | 25 mL        |           |          | Se T       | 6% HNO <sub>3</sub> , 5% HCl |
| K1807597-006                  | Homogenization Blank K1807185 | .01      | 25 mL       | 25 mL        |           |          | Se T       | 6% HNO <sub>3</sub> , 5% HCl |
| K1807597-007                  | Homogenization Blank K1807185 | .01      | 25 mL       | 25 mL        |           |          | Se T       | 6% HNO <sub>3</sub> , 5% HCl |

11 Total Samples consisting of 7 Client Samples, 2 Client QC Samples, 2 Batch QC Samples associated with the current Prep Run.

## Spiking Solutions

| Name         | Type  | ID     | Expires   | Name      | Type  | ID     | Expires   |
|--------------|-------|--------|-----------|-----------|-------|--------|-----------|
| K-MET GFLCSW | Spike | 187741 | 9/14/2018 | K-MET SS2 | Spike | 190897 | 1/22/2019 |

## Preparation Materials

| Step      | Name                   | ID     | Step      | Name                       | ID     |
|-----------|------------------------|--------|-----------|----------------------------|--------|
| Digestion | K-MET HCL              | 189025 | Digestion | K-MET 50ml Centrifuge Tube | 191046 |
| Digestion | K-MET HNO <sub>3</sub> | 190730 |           |                            |        |

## Preparation Hardware / Equipment

| Step      | Name          | Property              | Value    | Step      | Name          | Property              | Value    |
|-----------|---------------|-----------------------|----------|-----------|---------------|-----------------------|----------|
| Digestion | K-DGV 20-200  |                       |          | Digestion | K-HotPlate-02 | Observed Temperature  | 95 deg C |
| Digestion | K-HotPlate-02 | Corrected Temperature | 95 deg C | Digestion | K-HotPlate-02 | Thermometer ID 662485 | deg C    |
| Digestion | K-HotPlate-02 | Correction Factor     | 0 deg C  |           |               |                       |          |

## Preparation Steps

| Step      | Started         | Finished        | By      | Assisted By | Training? | Comments |
|-----------|-----------------|-----------------|---------|-------------|-----------|----------|
| Digestion | 23-AUG-18 09:10 | 23-AUG-18 12:14 | JHINSON |             | N         |          |

**Comments**

**Review**

Reviewed by:  Date: 8/24/18



# Preparation Information Benchsheet

Prep Run#: 320504

Team: Metals/JHINSON

Number of Copies to make: 1

Prep Workflow: MetDigAqICP

Prep Method: EPA 3010A

Status: Prepped

Prep Date/Time: 8/27/18 12:59

| #  | Lab Code     | Client ID                     | B#  | Method /Test | pH | Matrix | Amt. Ext. | Final Vol | Sample Description |
|----|--------------|-------------------------------|-----|--------------|----|--------|-----------|-----------|--------------------|
| 1  | KQ1811639-01 | MB                            |     | 7742/Se T    |    | Liquid | 25mL      | 25.00mL   | 6%HNO3, 5%HCl      |
| 2  | KQ1811639-02 | LCS                           |     | 7742/Se T    |    | Liquid | 25mL      | 25.00mL   | 6%HNO3, 5%HCl      |
| 3  | KQ1811639-05 | MDL                           |     | 7742/Se T    |    | Liquid | 50mL      | 50.00mL   | 6% HNO3, 5% HCL    |
| 4  | K1807597-008 | Rinsate Blank K1807185        | .01 | 7742/Se T    |    | Water  | 25mL      | 25.00mL   | 6%HNO3, 5%HCl      |
| 5  | K1807597-009 | Homogenization Blank K1807185 | .01 | 7742/Se T    |    | Water  | 25mL      | 25.00mL   | 6%HNO3, 5%HCl      |
| 6  | K1807597-010 | Homogenization Blank K1807185 | .01 | 7742/Se T    |    | Water  | 25mL      | 25.00mL   | 6%HNO3, 5%HCl      |
| 7  | KQ1811639-03 | K1807597-010 DUP              | .01 | 7742/Se T    |    | Liquid | 25mL      | 25.00mL   | 6%HNO3, 5%HCl      |
| 8  | KQ1811639-04 | K1807597-010 MS               | .01 | 7742/Se T    |    | Liquid | 25mL      | 25.00mL   | 6%HNO3, 5%HCl      |
| 9  | K1807597-011 | Rinsate Blank K1807189        | .01 | 7742/Se T    |    | Water  | 25mL      | 25.00mL   | 6%HNO3, 5%HCl      |
| 10 | K1807597-012 | Homogenization Blank K1807189 | .01 | 7742/Se T    |    | Water  | 25mL      | 25.00mL   | 6%HNO3, 5%HCl      |
| 11 | K1807597-013 | Homogenization Blank K1807189 | .01 | 7742/Se T    |    | Water  | 25mL      | 25.00mL   | 6%HNO3, 5%HCl      |
| 12 | K1807597-014 | Rinsate Blank K1807189        | .01 | 7742/Se T    |    | Water  | 25mL      | 25.00mL   | 6%HNO3, 5%HCl      |
| 13 | K1807597-015 | Homogenization Blank K1807189 | .01 | 7742/Se T    |    | Water  | 25mL      | 25.00mL   | 6%HNO3, 5%HCl      |
| 14 | K1807597-016 | Homogenization Blank K1807189 | .01 | 7742/Se T    |    | Water  | 25mL      | 25.00mL   | 6%HNO3, 5%HCl      |
| 15 | K1807597-017 | Rinsate Blank K1807189        | .01 | 7742/Se T    |    | Water  | 25mL      | 25.00mL   | 6%HNO3, 5%HCl      |
| 16 | K1807597-018 | Homogenization Blank K1807189 | .01 | 7742/Se T    |    | Water  | 25mL      | 25.00mL   | 6%HNO3, 5%HCl      |
| 17 | K1807597-019 | Homogenization Blank K1807189 | .01 | 7742/Se T    |    | Water  | 25mL      | 25.00mL   | 6%HNO3, 5%HCl      |

## Spiking Solutions

|                    |                     |                        |                        |
|--------------------|---------------------|------------------------|------------------------|
| Name: K-MET GFLCSW | Inventory ID 187741 | Logbook Ref: MET3-31-I | Expires On: 09/14/2018 |
|--------------------|---------------------|------------------------|------------------------|

KQ1811639-02 0.10mL

|                 |                     |                        |                        |
|-----------------|---------------------|------------------------|------------------------|
| Name: K-MET SS2 | Inventory ID 190897 | Logbook Ref: MET3-43-E | Expires On: 01/22/2019 |
|-----------------|---------------------|------------------------|------------------------|

KQ1811639-04 0.10mL

|                                            |                     |                       |                        |
|--------------------------------------------|---------------------|-----------------------|------------------------|
| Name: K-MET Hydride Spike Solution 100 ppb | Inventory ID 192682 | Logbook Ref: AA1-27-K | Expires On: 02/19/2019 |
|--------------------------------------------|---------------------|-----------------------|------------------------|

KQ1811639-05 0.25mL

## Preparation Materials

K-MET 50ml Centrifuge Tube P7233490 (191046) K-MET HCL 0000185016 (189025) K-MET HNO3 0000185596 (190730)

## Preparation Information Benchsheet

Prep Run#: 320504  
Team: Metals/JHINSON

Prep Workflow: MetDigAqICP  
Prep Method: EPA CLP-METALS ILM04.0

Status: Prepped  
Prep Date/Time: 8/27/18 12:59

### Preparation Steps

Step: Digestion  
Started: 8/27/18 12:59  
Finished: 8/27/18 16:00  
By: JHINSON  
Comments

### Preparation Equipment

|               |           |                       |          |               |           |                       |         |
|---------------|-----------|-----------------------|----------|---------------|-----------|-----------------------|---------|
| K-HotPlate-03 | Digestion | Corrected Temperature | 95 deg C | K-HotPlate-03 | Digestion | Correction Factor     | 0 deg C |
| K-HotPlate-03 | Digestion | Observed Temperature  | 95 deg C | K-HotPlate-03 | Digestion | Thermometer ID 662788 | deg C   |
| K-HotPlate-04 | Digestion | Corrected Temperature | 95 deg C | K-HotPlate-04 | Digestion | Correction Factor     | 0 deg C |
| K-HotPlate-04 | Digestion | Observed Temperature  | 95 deg C | K-HotPlate-04 | Digestion | Thermometer ID 660993 | deg C   |
| K-DGV 20-200  | Digestion |                       |          |               |           |                       |         |

Comments: \_\_\_\_\_

Reviewed By:  Date: 8/28/18

## Preparation Information Benchsheet

**Prep Run:** 323134    **Prep Workflow:** MetDigAqICP    **Status:** Prepped  
**Team:** Metals    **Prep Method:** EPA 3010A    **Current Step:** Digestion  
**Analyst:** JHINSON    **Rush/NPDES:** N/A  
**Prep Date:** 10/02/2018 11:37  
**Due Date:** 09/07/2018  
**Hold Date:** 01/30/2019

| Lab Code     | Client ID                               | Bottle # | Initial Amt | Final Volume | Spike Amt | Spike ID | Test No List | Comments                     |
|--------------|-----------------------------------------|----------|-------------|--------------|-----------|----------|--------------|------------------------------|
| KQ1813872-01 | Method Blank                            |          | 25 mL       | 25 mL        |           |          | Se T         | 6% HNO <sub>3</sub> , 5% HCl |
| KQ1813872-02 | Lab Control Sample                      |          | 25 mL       | 25 mL        | 0.1 mL    | 193589   | Se T         | 6% HNO <sub>3</sub> , 5% HCl |
| KQ1813872-03 | Duplicate Lab Control Sample            |          | 25 mL       | 25 mL        | 0.1 mL    | 193589   | Se T         | 6% HNO <sub>3</sub> , 5% HCl |
| K1807597-020 | Rinsete Blank-Northern Pike 8/03        | .01      | 25 mL       | 25 mL        |           |          | Se T         | 6% HNO <sub>3</sub> , 5% HCl |
| K1807597-021 | Homogenization Blank-Northern Pike 8/03 | .01      | 25 mL       | 25 mL        |           |          | Se T         | 6% HNO <sub>3</sub> , 5% HCl |
| K1807597-022 | Homogenization Blank-Northern Pike 8/03 | .01      | 25 mL       | 25 mL        |           |          | Se T         | 6% HNO <sub>3</sub> , 5% HCl |

6 Total Samples consisting of 3 Client Samples, 0 Client QC Samples, 3 Batch QC Samples associated with the current Prep Run.

## Spiking Solutions

| Name         | Type  | ID     | Expires   |
|--------------|-------|--------|-----------|
| K-MET GFLCSW | Spike | 193589 | 7/20/2019 |

## Preparation Materials

| Step      | Name                   | ID     | Step      | Name                       | ID     |
|-----------|------------------------|--------|-----------|----------------------------|--------|
| Digestion | K-MET HCL              | 189025 | Digestion | K-MET 50ml Centrifuge Tube | 192825 |
| Digestion | K-MET HNO <sub>3</sub> | 190730 |           |                            |        |

## Preparation Hardware / Equipment

| Step      | Name          | Property              | Value    | Step      | Name          | Property              | Value    |
|-----------|---------------|-----------------------|----------|-----------|---------------|-----------------------|----------|
| Digestion | K-DGV 20-200  |                       |          | Digestion | K-HotPlate-04 | Corrected Temperature | 95 deg C |
| Digestion | K-HotPlate-03 | Corrected Temperature | 95 deg C | Digestion | K-HotPlate-04 | Correction Factor     | 0 deg C  |
| Digestion | K-HotPlate-03 | Correction Factor     | 0 deg C  | Digestion | K-HotPlate-04 | Observed Temperature  | 95 deg C |
| Digestion | K-HotPlate-03 | Observed Temperature  | 95 deg C | Digestion | K-HotPlate-04 | Thermometer ID 660993 | deg C    |
| Digestion | K-HotPlate-03 | Thermometer ID 662788 | deg C    |           |               |                       |          |

## Preparation Steps

| Step      | Started         | Finished        | By      | Assisted By | Training? | Comments |
|-----------|-----------------|-----------------|---------|-------------|-----------|----------|
| Digestion | 02-OCT-18 11:37 | 02-OCT-18 15:08 | JHINSON |             | N         |          |

## Comments

## Review

Reviewed by: 27 Date: 10/3/18

**ALS Group USA, Corp.**  
dba ALS Environmental  
Analytical Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** 08/14-15/18  
**Date Received:** 08/15/18

Mercury, Total

**Prep Method:** METHOD  
**Analysis Method:** 1631E  
**Test Notes:**

**Units:** ng/L  
**Basis:** NA

| Sample Name                             | Lab Code     | MRL | MDL  | Dilution<br>Factor | Date<br>Extracted | Date<br>Analyzed | Result | Result<br>Notes |
|-----------------------------------------|--------------|-----|------|--------------------|-------------------|------------------|--------|-----------------|
| Rinsate Blank-Northern Pike 8/14        | K1807597-002 | 0.5 | 0.06 | 1                  | 08/16/18          | 08/17/18         | 0.32 ✓ | J               |
| Homogenization Blank-Northern Pike 8/14 | K1807597-003 | 0.5 | 0.06 | 1                  | 08/16/18          | 08/17/18         | 0.28 ✓ | J               |
| Homogenization Blank-Northern Pike 8/14 | K1807597-004 | 0.5 | 0.06 | 1                  | 08/16/18          | 08/17/18         | 0.25 ✓ | J               |
| Rinsate Blank-Northern Pike 8/15        | K1807597-005 | 0.5 | 0.06 | 1                  | 08/16/18          | 08/17/18         | 0.25 ✓ | J               |
| Homogenization Blank-Northern Pike 8/15 | K1807597-006 | 0.5 | 0.06 | 1                  | 08/16/18          | 08/17/18         | 0.21 ✓ | J               |
| Homogenization Blank-Northern Pike 8/15 | K1807597-007 | 0.5 | 0.06 | 1                  | 08/16/18          | 08/17/18         | 0.21 ✓ | J               |
| Method Blank 1                          | K1807597-MB1 | 0.5 | 0.06 | 1                  | 08/16/18          | 08/17/18         | ND     |                 |
| Method Blank 2                          | K1807597-MB2 | 0.5 | 0.06 | 1                  | 08/16/18          | 08/17/18         | 0.08 ✓ | J               |
| Method Blank 3                          | K1807597-MB3 | 0.5 | 0.06 | 1                  | 08/16/18          | 08/17/18         | 0.14 ✓ | J               |

*no blank qualification*

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/17/18

Ongoing Precision and Recovery (OPR) Sample Summary  
Total Metals

**Sample Name:** Ongoing Precision and Recovery (Initial) **Units:** ng/L  
**Basis:** NA

**Test Notes:**

| Analyte | Prep Method | Analysis Method | True Value | Result | Percent Recovery | ALS Percent Recovery | Result Notes |
|---------|-------------|-----------------|------------|--------|------------------|----------------------|--------------|
|         |             |                 |            |        |                  | Acceptance Limits    |              |
| Mercury | METHOD      | 1631E           | 5.00       | 4.80 ✓ | 96 ✓             | 77-123               |              |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/17/18

Ongoing Precision and Recovery (OPR) Sample Summary  
Total Metals

**Sample Name:** Ongoing Precision and Recovery (Final) **Units:** ng/L  
**Basis:** NA

**Test Notes:**

| Analyte | Prep Method | Analysis Method | True Value | Result | Percent Recovery | ALS Percent Recovery Acceptance Limits | Result Notes |
|---------|-------------|-----------------|------------|--------|------------------|----------------------------------------|--------------|
|         |             |                 |            |        |                  |                                        |              |
| Mercury | METHOD      | 1631E           | 5.00       | 5.15 ✓ | 103 ✓            | 77-123                                 |              |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 08/16/18  
**Date Analyzed:** 08/17/18

Quality Control Sample (QCS) Summary  
Total Metals

Sample Name: Quality Control Sample

Units: ng/L  
Basis: NA

Test Notes:

| Analyte | Prep<br>Method | Analysis<br>Method | True<br>Value | Result | Percent<br>Recovery | ALS<br>Percent<br>Recovery | Result<br>Notes |
|---------|----------------|--------------------|---------------|--------|---------------------|----------------------------|-----------------|
|         |                |                    |               |        |                     | Acceptance<br>Limits       |                 |
| Mercury | METHOD         | 1631E              | 5.00          | 4.78 ✓ | 96 ✓                | 77-123                     |                 |

# QA Summary Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/17/18 ✓

Analyst Name: Anna Boyer

| Calibration        |          |                 |       |             |       |             |      |           |        |
|--------------------|----------|-----------------|-------|-------------|-------|-------------|------|-----------|--------|
| QA Sample Type     | Name/ID  | Analyzed Result | Units | Spike Level | % REC | % REC Limit | RSD  | RSD Limit | Notes  |
| Calibration        | 12.5 pg  | 12.2            | pg    | 12.5        | 97.3  | 75-125      |      |           | accept |
|                    | 25 pg    | 26.8            | pg    | 25          | 107   | 75-125      |      |           | accept |
|                    | 100 pg   | 98.3            | pg    | 100         | 98.3  | 75-125      |      |           | accept |
|                    | 500 pg   | 519             | pg    | 500         | 104   | 75-125      |      |           | accept |
|                    | 2500 pg  | 2,420           | pg    | 2500        | 96.8  | 75-125      |      |           | accept |
|                    | 10000 pg | 9,740           | pg    | 10000       | 97.4  | 75-125      |      |           | accept |
| Calibration Factor |          | 0.000101        | pg/PA |             |       |             | 4.23 | < 15      | accept |
| Calibration Date   |          | 8/17/18         |       |             |       |             |      |           |        |



# QA Summary Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/17/18

Analyst Name: Anna Boyer

| Blank Summary  |          |                 |       |          |        |             |        |
|----------------|----------|-----------------|-------|----------|--------|-------------|--------|
| QA Sample Type | Name/ID  | Analyzed Result | Units | Criteria | StDev  | StDev Limit | Notes  |
| CB             | CB-1     | 3.01            | pg    | < 50     |        |             | accept |
|                | CB-2     | 3.75            | pg    | < 50     |        |             | accept |
|                | CB-3     | 2.91            | pg    | < 50     |        |             | accept |
|                | CB-4     | 3.86            | pg    | < 50     |        |             | accept |
| Average        | PA 33340 | 3.38            | pg    | < 25     | 0.492  | < 10        | accept |
| MBA            | MB-1     | 0.0340          | ng/L  | < 0.5    |        |             | accept |
|                | MB-2     | 0.0374          | ng/L  | < 0.5    |        |             | accept |
|                | MB-3     | 0.0327          | ng/L  | < 0.5    |        |             | accept |
|                | MB-1     | 0.0393          | ng/L  | < 0.5    |        |             | accept |
|                | MB-2     | 0.0259          | ng/L  | < 0.5    |        |             | accept |
|                | MB-3     | 0.0537          | ng/L  | < 0.5    |        |             | accept |
|                | MB-1     | 0.0209          | ng/L  | < 0.5 ✓  |        |             | accept |
|                | MB-2     | 0.0845 ✓        | ng/L  | < 0.5    |        |             | accept |
|                | MB-3     | 0.138 ✓         | ng/L  | < 0.5    |        |             | accept |
|                | MB-1     | 0.0621          | ng/L  | < 0.5    |        |             | accept |
|                | MB-2     | 0.0350          | ng/L  | < 0.5    |        |             | accept |
|                | MB-3     | 0.0788          | ng/L  | < 0.5    |        |             | accept |
| Average        |          | 0.0535          | ng/L  |          | 0.0334 |             |        |

$$(PA - 33340) (0.000101) \cdot \frac{\sqrt{D}}{\sqrt{S} \cdot \sqrt{A}} = \text{ng/L}$$

# QA Summary Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/17/18

Analyst Name: Anna Boyer

| Bias and Precision |                         |                 |                 |                 |                 |                 |                   |      |           |        |
|--------------------|-------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------------|------|-----------|--------|
| Type               | Name/ID                 | Final Result    | Units           | Spike Level     | Source Result   | % REC           | % REC Limit       | RPD  | RPD Limit | Notes  |
| MS                 | K1807512-001            | 51.9            | ng/L            | 50.0            | 3.06            | 97.7            | 71-125            |      |           | accept |
|                    | K1807512-001 DISS       | 54.4            | ng/L            | 50.0            | 2.18            | 104             | 71-125            |      |           | accept |
|                    | K1807512-016            | 52.2            | ng/L            | 50.0            | 1.48            | 101             | 71-125            |      |           | accept |
|                    | K1807512-016 DISS       | 48.3            | ng/L            | 50.0            | 1.19            | 94.2            | 71-125            |      |           | accept |
|                    | K1807794-001            | 48.0            | ng/L            | 50.0            | 0.206           | 95.6            | 71-125            |      |           | accept |
|                    | K1807705-002            | 50.1            | ng/L            | 50.0            | 1.97            | 96.2            | 71-125            |      |           | accept |
|                    | <del>K1807798-001</del> | <del>18.7</del> | <del>ng/L</del> | <del>50.0</del> | <del>3.48</del> | <del>30.4</del> | <del>71-125</del> |      |           | reject |
|                    | K1807784-001            | 45.4            | ng/L            | 50.0            | 0.248           | 90.3            | 71-125            |      |           | accept |
| MSD                | K1807512-001            | 55.0            | ng/L            | 50.0            | 3.06            | 104             | 71-125            | 5.81 | < 24      | accept |
|                    | K1807512-001 DISS       | 49.9            | ng/L            | 50.0            | 2.18            | 95.5            | 71-125            | 8.58 | < 24      | accept |
|                    | K1807512-016            | 49.4            | ng/L            | 50.0            | 1.48            | 95.8            | 71-125            | 5.54 | < 24      | accept |
|                    | K1807512-016 DISS       | 51.6            | ng/L            | 50.0            | 1.19            | 101             | 71-125            | 6.66 | < 24      | accept |
|                    | K1807794-001            | 49.9            | ng/L            | 50.0            | 0.206           | 99.3            | 71-125            | 3.76 | < 24      | accept |
|                    | K1807705-002            | 47.4            | ng/L            | 50.0            | 1.97            | 90.9            | 71-125            |      |           | accept |
|                    | <del>K1807798-001</del> | <del>18.4</del> | <del>ng/L</del> | <del>50.0</del> | <del>3.48</del> | <del>29.8</del> | <del>71-125</del> |      |           | reject |
|                    | K1807784-001            | 49.3            | ng/L            | 50.0            | 0.248           | 98.0            | 71-125            |      |           | accept |
| OPR                | OPR-1                   | 5.06            | ng/L            | 5.0             |                 | 101             | 77-123            |      |           | accept |
|                    | OPR-2                   | 4.98            | ng/L            | 5.0             |                 | 99.6            | 77-123            |      |           | accept |
|                    | OPR-3                   | 5.23            | ng/L            | 5.0             |                 | 105             | 77-123            |      |           | accept |
|                    | OPR-4                   | 4.80 ✓          | ng/L            | 5.0             |                 | 95.9 ✓          | 77-123            |      |           | accept |
|                    | OPR-5                   | 5.15 ✓          | ng/L            | 5.0             |                 | 103 ✓           | 77-123            |      |           | accept |
|                    | OPR-6                   | 4.79            | ng/L            | 5.0             |                 | 95.8            | 77-123            |      |           | accept |

AB  
8/20/18

AB  
8/20/18

## QA Summary Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/17/18

Analyst Name: Anna Boyer

| Bias and Precision |         |              |       |             |               |        |             |     |        |
|--------------------|---------|--------------|-------|-------------|---------------|--------|-------------|-----|--------|
| Type               | Name/ID | Final Result | Units | Spike Level | Source Result | % REC  | % REC Limit | RPD | Notes  |
| QCS                | QCS-1   | 4.86         | ng/L  | 5.0         |               | 97.1   | 77-123      |     | accept |
|                    | QCS-1   | 4.35         | ng/L  | 5.0         |               | 87.0   | 77-123      |     | accept |
|                    | QCS-1   | 4.78 ✓       | ng/L  | 5.0         |               | 95.6 ✓ | 77-123      |     | accept |
|                    | QCS-1   | 3.99         | ng/L  | 5.0         |               | 79.7   | 77-123      |     | accept |

# Run Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/17/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID           | Method<br>Blank | Peak | Peak Area    | Analyzed Result<br>(pg) | Final Result<br>(ng/L) | QA Results | Criteria | Notes  |
|-----|------|------|-------------------|-----------------|------|--------------|-------------------------|------------------------|------------|----------|--------|
| 1   | X    | CCB  | RINSE             |                 | 1    | 60,326       | 2.74                    |                        | 2.74       | < 50     | accept |
| 2   | Y    | CCB  | RINSE             |                 | 1    | 39,554       | 0.631                   |                        | 0.631      | < 50     | accept |
| 3   | X    | CB   | CB-1              |                 | 1    | 29,628 ✓     | 3.01                    |                        | 3.01       | < 50     | accept |
| 4   | Y    | CB   | CB-2              |                 | 1    | 36,962 ✓     | 3.75                    |                        | 3.75       | < 50     | accept |
| 5   | X    | CB   | CB-3              |                 | 1    | 28,717 ✓     | 2.91                    |                        | 2.91       | < 50     | accept |
| 6   | Y    | CB   | CB-4              |                 | 1    | 38,052 ✓     | 3.86                    |                        | 3.86       | < 50     | accept |
| 7   | X    | STD  | 12.5 pg           |                 | 1    | 153,242 ✓    | 12.2                    |                        | 97.3       | 75-125   | accept |
| 8   | Y    | STD  | 25 pg             |                 | 1    | 297,739 ✓    | 26.8                    |                        | 107        | 75-125   | accept |
| 9   | X    | STD  | 100 pg            |                 | 1    | 1,001,944 ✓  | 98.3                    |                        | 98.3       | 75-125   | accept |
| 10  | Y    | STD  | 500 pg            |                 | 1    | 5,151,588 ✓  | 519                     |                        | 104        | 75-125   | accept |
| 11  | X    | STD  | 2500 pg           |                 | 1    | 23,871,280 ✓ | 2,420                   |                        | 96.8       | 75-125   | accept |
| 12  | Y    | STD  | 10000 pg          |                 | 1    | 96,003,607 ✓ | 9,740                   |                        | 97.4       | 75-125   | accept |
| 13  | X    | OPR  | OPR-1             |                 | 1    | 1,278,816    | 126                     | 5.06                   | 101        | 77-123   | accept |
| 14  | Y    | S    | 1631 BOTTLE 8/15  |                 | 1    | 112,071      | 7.99                    | 0.320                  |            | < HS     | accept |
| 15  | X    | S    | 1631 BOTTLE 8/15  |                 | 1    | 56,012       | 2.30                    | 0.0920                 |            | < HS     | accept |
| 16  | Y    | S    | 1631 BOTTLE 8/15  |                 | 1    | 77,804       | 4.51                    | 0.180                  |            | < HS     | accept |
| 17  | X    | OPR  | OPR-2             |                 | 1    | 1,260,253    | 124                     | 4.98                   | 99.6       | 77-123   | accept |
| 18  | Y    | QCS  | QCS-1             |                 | 1    | 1,230,139    | 121                     | 4.86                   | 97.1       | 77-123   | accept |
| 19  | X    | MBA  | MB-1              |                 | 1    | 41,727       | 0.851                   | 0.0340                 | 0.0340     | < 0.5    | accept |
| 20  | Y    | S    | K1807428-008 LOD  |                 | 1    | 89,561       | 5.70                    | 0.228                  |            | < HS     | accept |
| 21  | X    | S    | K1807428-008 LOQ  |                 | 1    | 257,909      | 22.8                    | 0.911                  |            | < HS     | accept |
| 22  | Y    | S    | K1807512-001      |                 | 1    | 788,262      | 76.6                    | 3.06                   |            | < HS     | accept |
| 23  | X    | MS   | K1807512-001      |                 | 1    | 12,823,389   | 1,300                   | 51.9                   | 97.7       | 71-125   | accept |
| 24  | Y    | MSD  | K1807512-001      |                 | 1    | 13,588,731   | 1,380                   | 55.0                   | 104        | 71-125   | accept |
| 25  | X    | S    | K1807512-002      |                 | 1    | 534,686      | 50.9                    | 2.03                   |            | < HS     | accept |
| 26  | Y    | S    | K1807512-004      |                 | 1    | 2,091,351    | 209                     | 8.35                   |            | < HS     | accept |
| 27  | X    | S    | K1807512-005      |                 | 1    | 372,583      | 34.4                    | 1.38                   |            | < HS     | accept |
| 28  | Y    | S    | K1807512-006      |                 | 1    | 873,100      | 85.2                    | 3.41                   |            | < HS     | accept |
| 29  | X    | S    | K1807512-007      |                 | 1    | 1,048,762    | 103                     | 4.12                   |            | < HS     | accept |
| 30  | Y    | S    | K1807512-008      |                 | 1    | 807,287      | 78.5                    | 3.14                   |            | < HS     | accept |
| 31  | X    | S    | K1807512-009      |                 | 1    | 729,719      | 70.7                    | 2.83                   |            | < HS     | accept |
| 32  | Y    | MBA  | MB-2              |                 | 1    | 42,545       | 0.934                   | 0.0374                 | 0.0374     | < 0.5    | accept |
| 33  | X    | S    | K1807512-001 DISS |                 | 1    | 569,524      | 54.4                    | 2.18                   |            | < HS     | accept |

# Run Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/17/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID           | Method | Peak | Peak Area  | Analyzed Result | Final Result | QA Results | Criteria | Notes  |
|-----|------|------|-------------------|--------|------|------------|-----------------|--------------|------------|----------|--------|
|     |      |      |                   | Blank  |      |            | (pg)            | (ng/L)       |            |          |        |
| 34  | Y    | MS   | K1807512-001 DISS |        | 1    | 13,435,432 | 1,360           | 54.4         | 104        | 71-125   | accept |
| 35  | X    | MSD  | K1807512-001 DISS |        | 1    | 12,332,708 | 1,250           | 49.9         | 95.5       | 71-125   | accept |
| 36  | Y    | S    | K1807512-010      |        | 1    | 706,378    | 68.3            | 2.73         |            | < HS     | accept |
| 37  | X    | S    | K1807512-002 DISS |        | 1    | 334,686    | 30.6            | 1.22         |            | < HS     | accept |
| 38  | Y    | S    | K1807512-004 DISS |        | 1    | 433,403    | 40.6            | 1.62         |            | < HS     | accept |
| 39  | X    | S    | K1807512-005 DISS |        | 1    | 324,118    | 29.5            | 1.18         |            | < HS     | accept |
| 40  | Y    | S    | K1807512-006 DISS |        | 1    | 589,318    | 56.4            | 2.26         |            | < HS     | accept |
| 41  | X    | S    | K1807512-007 DISS |        | 1    | 441,297    | 41.4            | 1.66         |            | < HS     | accept |
| 42  | Y    | S    | K1807512-008 DISS |        | 1    | 537,875    | 51.2            | 2.05         |            | < HS     | accept |
| 43  | X    | S    | K1807512-009 DISS |        | 1    | 312,122    | 28.3            | 1.13         |            | < HS     | accept |
| 44  | Y    | S    | K1807512-010 DISS |        | 1    | 423,454    | 39.6            | 1.58         |            | < HS     | accept |
| 45  | X    | MBA  | MB-3              |        | 1    | 41,388     | 0.817           | 0.0327       | 0.0327     | < 0.5    | accept |
| 46  | Y    | OPR  | OPR-3             |        | 1    | 1,321,205  | 131             | 5.23         | 105        | 77-123   | accept |
| 47  | X    | QCS  | QCS-1             |        | 1    | 1,105,423  | 109             | 4.35         | 87.0       | 77-123   | accept |
| 48  | Y    | MBA  | MB-1              |        | 1    | 43,015     | 0.982           | 0.0393       | 0.0393     | < 0.5    | accept |
| 49  | X    | S    | K1807512-016      |        | 1    | 398,848    | 37.1            | 1.48         |            | < HS     | accept |
| 50  | Y    | MS   | K1807512-016      |        | 1    | 12,898,032 | 1,310           | 52.2         | 101        | 71-125   | accept |
| 51  | X    | MSD  | K1807512-016      |        | 1    | 12,203,941 | 1,230           | 49.4         | 95.8       | 71-125   | accept |
| 52  | Y    | S    | K1807512-011      |        | 1    | 861,665    | 84.0            | 3.36         |            | < HS     | accept |
| 53  | X    | S    | K1807512-012      |        | 1    | 58,814     | 2.58            | 0.103        |            | < HS     | accept |
| 54  | Y    | S    | K1807512-013      |        | 1    | 463,901    | 43.7            | 1.75         |            | < HS     | accept |
| 55  | X    | S    | K1807512-014      |        | 1    | 383,270    | 35.5            | 1.42         |            | < HS     | accept |
| 56  | Y    | S    | K1807512-015      |        | 1    | 538,344    | 51.2            | 2.05         |            | < HS     | accept |
| 57  | X    | S    | K1807512-017      |        | 1    | 199,208    | 16.8            | 0.673        |            | < HS     | accept |
| 58  | Y    | S    | K1807512-018      |        | 1    | 5,193,203  | 524             | 20.9         |            | < HS     | accept |
| 59  | X    | S    | K1807512-019      |        | 1    | 742,816    | 72.0            | 2.88         |            | < HS     | accept |
| 60  | Y    | S    | K1807512-020      |        | 1    | 5,420,781  | 547             | 21.9         |            | < HS     | accept |
| 61  | X    | MBA  | MB-2              |        | 1    | 39,713     | 0.647           | 0.0259       | 0.0259     | < 0.5    | accept |
| 62  | Y    | S    | K1807512-016 DISS |        | 1    | 327,103    | 29.8            | 1.19         |            | < HS     | accept |
| 63  | X    | MS   | K1807512-016 DISS |        | 1    | 11,926,847 | 1,210           | 48.3         | 94.2       | 71-125   | accept |
| 64  | Y    | MSD  | K1807512-016 DISS |        | 1    | 12,746,280 | 1,290           | 51.6         | 101        | 71-125   | accept |
| 65  | X    | S    | K1807512-011 DISS |        | 1    | 464,129    | 43.7            | 1.75         |            | < HS     | accept |
| 66  | Y    | S    | K1807512-012 DISS |        | 1    | 67,200     | 3.44            | 0.137        |            | < HS     | accept |

# Run Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/17/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID           | Method<br>Blank | Peak | Peak Area   | Analyzed Result<br>(pg) | Final Result<br>(ng/L) | QA Results | Criteria | Notes  |
|-----|------|------|-------------------|-----------------|------|-------------|-------------------------|------------------------|------------|----------|--------|
| 67  | X    | S    | K1807512-013 DISS |                 | 1    | 308,558     | 27.9                    | 1.12                   |            | < HS     | accept |
| 68  | Y    | S    | K1807512-014 DISS |                 | 1    | 342,360     | 31.4                    | 1.25                   |            | < HS     | accept |
| 69  | X    | S    | K1807512-015 DISS |                 | 1    | 191,069     | 16.0                    | 0.640                  |            | < HS     | accept |
| 70  | Y    | S    | K1807512-017 DISS |                 | 1    | 183,921     | 15.3                    | 0.611                  |            | < HS     | accept |
| 71  | X    | S    | K1807512-018 DISS |                 | 1    | 1,052,195   | 103                     | 4.14                   |            | < HS     | accept |
| 72  | Y    | S    | K1807512-019 DISS |                 | 1    | 499,509     | 47.3                    | 1.89                   |            | < HS     | accept |
| 73  | X    | S    | K1807512-020 DISS |                 | 1    | 1,046,479   | 103                     | 4.11                   |            | < HS     | accept |
| 74  | Y    | MBA  | MB-3              |                 | 1    | 46,580      | 1.34                    | 0.0537                 | 0.0537     | < 0.5    | accept |
| 75  | X    | OPR  | OPR-4             |                 | 1    | 1,214,945 ✓ | 120. ✓                  | 4.80 ✓                 | 95.9       | 77-123   | accept |
| 76  | Y    | QCS  | QCS-1             |                 | 1    | 1,211,281 ✓ | 120. ✓                  | 4.78 ✓                 | 95.6       | 77-123   | accept |
| 77  | X    | MBA  | MB-1              |                 | 1    | 38,477      | 0.521                   | 0.0209                 | 0.0209     | < 0.5    | accept |
| 78  | Y    | S    | K1807794-001      |                 | 1    | 84,108      | 5.15                    | 0.206                  |            | < HS     | accept |
| 79  | X    | MS   | K1807794-001      |                 | 1    | 11,864,875  | 1,200                   | 48.0                   | 95.6       | 71-125   | accept |
| 80  | Y    | MSD  | K1807794-001      |                 | 1    | 12,317,665  | 1,250                   | 49.9                   | 99.3       | 71-125   | accept |
| 81  | X    | S    | K1807794-002      |                 | 1    | 94,157      | 6.17                    | 0.247                  |            | < HS     | accept |
| 82  | Y    | S    | K1807794-003      |                 | 1    | 97,146      | 6.47                    | 0.259                  |            | < HS     | accept |
| 83  | X    | S    | K1807794-001 DISS |                 | 1    | 135,944     | 10.4                    | 0.416                  |            | < HS     | accept |
| 84  | Y    | S    | K1807794-002 DISS |                 | 1    | 106,257     | 7.40                    | 0.296                  |            | < HS     | accept |
| 85  | X    | S    | K1807794-003 DISS |                 | 1    | 109,437     | 7.72                    | 0.309                  |            | < HS     | accept |
| 86  | Y    | S    | K1807761-001      |                 | 1    | 84,045      | 5.14                    | 0.206                  |            | < HS     | accept |
| 87  | X    | S    | K1807761-002      |                 | 1    | 503,477     | 47.7                    | 1.91                   |            | < HS     | accept |
| 88  | Y    | S    | K1807761-003      |                 | 1    | 519,161     | 49.3                    | 1.97                   |            | < HS     | accept |
| 89  | X    | S    | K1807705-001      |                 | 1    | 283,531     | 25.4                    | 1.02                   |            | < HS     | accept |
| 90  | Y    | MBA  | MB-2              |                 | 1    | 54,169 ✓    | 2.11 ✓                  | 0.0845 ✓               | 0.0845     | < 0.5    | accept |
| 91  | X    | S    | K1807705-002      |                 | 1    | 518,698     | 49.2                    | 1.97                   |            | < HS     | accept |
| 92  | Y    | MS   | K1807705-002      |                 | 1    | 12,372,491  | 1,250                   | 50.1                   | 96.2       | 71-125   | accept |
| 93  | X    | MSD  | K1807705-002      |                 | 1    | 11,722,620  | 1,190                   | 47.4                   | 90.9       | 71-125   | accept |
| 94  | Y    | S    | K1807700-001      |                 | 1    | 30,792,509  | 3,120                   | 125                    |            | < HS     | accept |
| 95  | X    | S    | K1807700-002      |                 | 1    | 9,553,285   | 966                     | 38.6                   |            | < HS     | accept |
| 96  | Y    | S    | K1807762-007      |                 | 1    | 612,171     | 58.7                    | 2.35                   |            | < HS     | accept |
| 97  | X    | S    | K1807597-002      |                 | 1    | 113,049 ✓   | 8.09 ✓                  | 0.324 ✓                |            | < HS     | accept |
| 98  | Y    | S    | K1807597-003      |                 | 1    | 103,067 ✓   | 7.08 ✓                  | 0.283 ✓                |            | < HS     | accept |
| 99  | X    | S    | K1807597-004      |                 | 1    | 94,862 ✓    | 6.24 ✓                  | 0.250 ✓                |            | < HS     | accept |

# Run Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/17/18

Analyst Name: Anna Boyer

| Run | Trap Type | Name/ID      | Method<br>Blank         | Peak | Peak Area          | Analyzed Result<br>(pg) | Final Result<br>(ng/L) | QA Results | Criteria           | Notes             |
|-----|-----------|--------------|-------------------------|------|--------------------|-------------------------|------------------------|------------|--------------------|-------------------|
| 100 | Y         | S            | K1807597-005            | 1    | 94,479 ✓           | 6.20 ✓                  | 0.248 ✓                |            | < HS               | accept            |
| 101 | X         | S            | K1807597-006            | 1    | 84,867 ✓           | 5.23 ✓                  | 0.209 ✓                |            | < HS               | accept            |
| 102 | Y         | S            | K1807597-007            | 1    | 84,507 ✓           | 5.19 ✓                  | 0.208 ✓                |            | < HS               | accept            |
| 103 | X         | MBA          | MB-3                    | 1    | 67,313 ✓           | 3.45 ✓                  | 0.138 ✓                | 0.138      | < 0.5              | accept            |
| 104 | Y         | OPR          | OPR-5                   | 1    | 1,303,150 ✓        | 129 ✓                   | 5.15 ✓                 | 103        | 77-123             | accept            |
| 105 | X         | QCS          | QCS-1                   | 1    | 1,015,229 ✓        | 99.6 ✓                  | 3.99 ✓                 | 79.7       | 77-123             | accept            |
| 106 | Y         | MBA          | MB-1                    | 1    | 48,637             | 1.55                    | 0.0621                 | 0.0621     | < 0.5              | accept            |
| 107 | X         | <del>S</del> | <del>K1807798-001</del> | 1    | <del>890,299</del> | <del>87.0</del>         | <del>3.48</del>        |            | <del>&lt; HS</del> | <del>accept</del> |
| 108 | Y         | MS           | K1807798-001            | 1    | 4,631,136          | 467                     | 18.7                   | 30.4       | 71-125             | reject            |
| 109 | X         | MSD          | K1807798-001            | 1    | 4,559,179          | 459                     | 18.4                   | 29.8       | 71-125             | reject            |
| 110 | Y         | S            | K1807798-001 DISS       | 1    | 661,143            | 63.7                    | 2.55                   |            | < HS               | accept            |
| 111 | X         | S            | K1807782-001            | 1    | 120,557            | 8.85                    | 0.354                  |            | < HS               | accept            |
| 112 | Y         | S            | K1807782-002            | 1    | 7,967,262          | 805                     | 32.2                   |            | < HS               | accept            |
| 113 | X         | S            | K1807784-002            | 1    | 134,158            | 10.2                    | 0.409                  |            | < HS               | accept            |
| 114 | Y         | S            | K1807784-003            | 1    | 93,329             | 6.09                    | 0.243                  |            | < HS               | accept            |
| 115 | X         | S            | K1807784-004            | 1    | 78,439             | 4.58                    | 0.183                  |            | < HS               | accept            |
| 116 | Y         | S            | K1807784-005            | 1    | 84,673             | 5.21                    | 0.208                  |            | < HS               | accept            |
| 117 | X         | S            | K1807784-006            | 1    | 99,238             | 6.69                    | 0.267                  |            | < HS               | accept            |
| 118 | Y         | <del>S</del> | <del>K1807784-007</del> | 1    | <del>143,647</del> | <del>11.2</del>         | <del>0.448</del>       |            | <del>&lt; HS</del> | <del>accept</del> |
| 119 | X         | MBA          | MB-2                    | 1    | 41,966             | 0.875                   | 0.0350                 | 0.0350     | < 0.5              | accept            |
| 120 | Y         | S            | K1807784-001            | 1    | 94,463             | 6.20                    | 0.248                  |            | < HS               | accept            |
| 121 | X         | MS           | K1807784-001            | 1    | 11,220,559         | 1,140                   | 45.4                   | 90.3       | 71-125             | accept            |
| 122 | Y         | MSD          | K1807784-001            | 1    | 12,171,804         | 1,230                   | 49.3                   | 98.0       | 71-125             | accept            |
| 123 | X         | S            | K1807784-008            | 1    | 160,444            | 12.9                    | 0.516                  |            | < HS               | accept            |
| 124 | Y         | S            | K1807784-009            | 1    | 143,538            | 11.2                    | 0.447                  |            | < HS               | accept            |
| 125 | X         | S            | K1807784-010            | 1    | 93,323             | 6.09                    | 0.243                  |            | < HS               | accept            |
| 126 | Y         | S            | K1807784-011            | 1    | 97,123             | 6.47                    | 0.259                  |            | < HS               | accept            |
| 127 | X         | S            | K1807784-013            | 1    | 105,742            | 7.35                    | 0.294                  |            | < HS               | accept            |
| 128 | Y         | MBA          | MB-3                    | 1    | 52,749             | 1.97                    | 0.0788                 | 0.0788     | < 0.5              | accept            |
| 129 | X         | OPR          | OPR-6                   | 1    | 1,213,806          | 120.                    | 4.79                   | 95.8       | 77-123             | accept            |

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# Run Information Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/17/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID           | Method Blank | Sample Vol/Wt | Dilution Vol (ml) | Analyzed Vol (ml) | Expected Value | Notes |
|-----|------|------|-------------------|--------------|---------------|-------------------|-------------------|----------------|-------|
| 1   | X    | CCB  | RINSE             |              |               |                   |                   |                |       |
| 2   | Y    | CCB  | RINSE             |              |               |                   |                   |                |       |
| 3   | X    | CB   | CB-1              |              |               |                   |                   |                |       |
| 4   | Y    | CB   | CB-2              |              |               |                   |                   |                |       |
| 5   | X    | CB   | CB-3              |              |               |                   |                   |                |       |
| 6   | Y    | CB   | CB-4              |              |               |                   |                   |                |       |
| 7   | X    | STD  | 12.5 pg           |              |               |                   |                   | 12.5           |       |
| 8   | Y    | STD  | 25 pg             |              |               |                   |                   | 25             |       |
| 9   | X    | STD  | 100 pg            |              |               |                   |                   | 100            |       |
| 10  | Y    | STD  | 500 pg            |              |               |                   |                   | 500            |       |
| 11  | X    | STD  | 2500 pg           |              |               |                   |                   | 2500           |       |
| 12  | Y    | STD  | 10000 pg          |              |               |                   |                   | 10000          |       |
| 13  | X    | OPR  | OPR-1             |              | 25            | 25                | 25                | 5.0            |       |
| 14  | Y    | S    | 1631 BOTTLE 8/15  |              | 125           | 125               | 25                |                |       |
| 15  | X    | S    | 1631 BOTTLE 8/15  |              | 125           | 125               | 25                |                |       |
| 16  | Y    | S    | 1631 BOTTLE 8/15  |              | 125           | 125               | 25                |                |       |
| 17  | X    | OPR  | OPR-2             |              | 25            | 25                | 25                | 5.0            |       |
| 18  | Y    | QCS  | QCS-1             |              | 125           | 125               | 25                | 5.0            |       |
| 19  | X    | MBA  | MB-1              |              | 125           | 125               | 25                |                |       |
| 20  | Y    | S    | K1807428-008 LOD  |              | 125           | 125               | 25                |                |       |
| 21  | X    | S    | K1807428-008 LOQ  |              | 125           | 125               | 25                |                |       |
| 22  | Y    | S    | K1807512-001      |              | 125           | 125               | 25                |                |       |
| 23  | X    | MS   | K1807512-001      |              | 125           | 125               | 25                | 50.0           |       |
| 24  | Y    | MSD  | K1807512-001      |              | 125           | 125               | 25                | 50.0           |       |
| 25  | X    | S    | K1807512-002      |              | 125           | 125               | 25                |                |       |
| 26  | Y    | S    | K1807512-004      |              | 125           | 125               | 25                |                |       |
| 27  | X    | S    | K1807512-005      |              | 125           | 125               | 25                |                |       |
| 28  | Y    | S    | K1807512-006      |              | 125           | 125               | 25                |                |       |
| 29  | X    | S    | K1807512-007      |              | 125           | 125               | 25                |                |       |
| 30  | Y    | S    | K1807512-008      |              | 125           | 125               | 25                |                |       |
| 31  | X    | S    | K1807512-009      |              | 125           | 125               | 25                |                |       |
| 32  | Y    | MBA  | MB-2              |              | 125           | 125               | 25                |                |       |
| 33  | X    | S    | K1807512-001 DISS |              | 125           | 125               | 25                |                |       |



# Run Information Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/17/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID           | Method<br>Blank | Sample<br>Vol/Wt | Dilution<br>Vol (ml) | Analyzed<br>Vol (ml) | Expected<br>Value | Notes |
|-----|------|------|-------------------|-----------------|------------------|----------------------|----------------------|-------------------|-------|
| 34  | Y    | MS   | K1807512-001 DISS |                 | 125              | 125                  | 25                   | 50.0              |       |
| 35  | X    | MSD  | K1807512-001 DISS |                 | 125              | 125                  | 25                   | 50.0              |       |
| 36  | Y    | S    | K1807512-010      |                 | 125              | 125                  | 25                   |                   |       |
| 37  | X    | S    | K1807512-002 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 38  | Y    | S    | K1807512-004 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 39  | X    | S    | K1807512-005 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 40  | Y    | S    | K1807512-006 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 41  | X    | S    | K1807512-007 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 42  | Y    | S    | K1807512-008 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 43  | X    | S    | K1807512-009 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 44  | Y    | S    | K1807512-010 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 45  | X    | MBA  | MB-3              |                 | 125              | 125                  | 25                   |                   |       |
| 46  | Y    | OPR  | OPR-3             |                 | 25               | 25                   | 25                   | 5.0               |       |
| 47  | X    | QCS  | QCS-1             |                 | 125              | 125                  | 25                   | 5.0               |       |
| 48  | Y    | MBA  | MB-1              |                 | 125              | 125                  | 25                   |                   |       |
| 49  | X    | S    | K1807512-016      |                 | 125              | 125                  | 25                   |                   |       |
| 50  | Y    | MS   | K1807512-016      |                 | 125              | 125                  | 25                   | 50.0              |       |
| 51  | X    | MSD  | K1807512-016      |                 | 125              | 125                  | 25                   | 50.0              |       |
| 52  | Y    | S    | K1807512-011      |                 | 125              | 125                  | 25                   |                   |       |
| 53  | X    | S    | K1807512-012      |                 | 125              | 125                  | 25                   |                   |       |
| 54  | Y    | S    | K1807512-013      |                 | 125              | 125                  | 25                   |                   |       |
| 55  | X    | S    | K1807512-014      |                 | 125              | 125                  | 25                   |                   |       |
| 56  | Y    | S    | K1807512-015      |                 | 125              | 125                  | 25                   |                   |       |
| 57  | X    | S    | K1807512-017      |                 | 125              | 125                  | 25                   |                   |       |
| 58  | Y    | S    | K1807512-018      |                 | 125              | 125                  | 25                   |                   |       |
| 59  | X    | S    | K1807512-019      |                 | 125              | 125                  | 25                   |                   |       |
| 60  | Y    | S    | K1807512-020      |                 | 125              | 125                  | 25                   |                   |       |
| 61  | X    | MBA  | MB-2              |                 | 125              | 125                  | 25                   |                   |       |
| 62  | Y    | S    | K1807512-016 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 63  | X    | MS   | K1807512-016 DISS |                 | 125              | 125                  | 25                   | 50.0              |       |
| 64  | Y    | MSD  | K1807512-016 DISS |                 | 125              | 125                  | 25                   | 50.0              |       |
| 65  | X    | S    | K1807512-011 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 66  | Y    | S    | K1807512-012 DISS |                 | 125              | 125                  | 25                   |                   |       |

# Run Information Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/17/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID           | Method<br>Blank | Sample<br>Vol/Wt | Dilution<br>Vol (ml) | Analyzed<br>Vol (ml) | Expected<br>Value | Notes |
|-----|------|------|-------------------|-----------------|------------------|----------------------|----------------------|-------------------|-------|
| 67  | X    | S    | K1807512-013 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 68  | Y    | S    | K1807512-014 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 69  | X    | S    | K1807512-015 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 70  | Y    | S    | K1807512-017 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 71  | X    | S    | K1807512-018 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 72  | Y    | S    | K1807512-019 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 73  | X    | S    | K1807512-020 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 74  | Y    | MBA  | MB-3              |                 | 125              | 125                  | 25                   |                   |       |
| 75  | X    | OPR  | OPR-4             |                 | 25               | 25                   | 25                   | 5.0               |       |
| 76  | Y    | QCS  | QCS-1             |                 | 125              | 125                  | 25                   | 5.0               |       |
| 77  | X    | MBA  | MB-1              |                 | 125              | 125                  | 25                   |                   |       |
| 78  | Y    | S    | K1807794-001      |                 | 125              | 125                  | 25                   |                   |       |
| 79  | X    | MS   | K1807794-001      |                 | 125              | 125                  | 25                   | 50.0              |       |
| 80  | Y    | MSD  | K1807794-001      |                 | 125              | 125                  | 25                   | 50.0              |       |
| 81  | X    | S    | K1807794-002      |                 | 125              | 125                  | 25                   |                   |       |
| 82  | Y    | S    | K1807794-003      |                 | 125              | 125                  | 25                   |                   |       |
| 83  | X    | S    | K1807794-001 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 84  | Y    | S    | K1807794-002 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 85  | X    | S    | K1807794-003 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 86  | Y    | S    | K1807761-001      |                 | 125              | 125                  | 25                   |                   |       |
| 87  | X    | S    | K1807761-002      |                 | 125              | 125                  | 25                   |                   |       |
| 88  | Y    | S    | K1807761-003      |                 | 125              | 125                  | 25                   |                   |       |
| 89  | X    | S    | K1807705-001      |                 | 125              | 125                  | 25                   |                   |       |
| 90  | Y    | MBA  | MB-2              |                 | 125              | 125                  | 25                   |                   |       |
| 91  | X    | S    | K1807705-002      |                 | 125              | 125                  | 25                   |                   |       |
| 92  | Y    | MS   | K1807705-002      |                 | 125              | 125                  | 25                   | 50.0              |       |
| 93  | X    | MSD  | K1807705-002      |                 | 125              | 125                  | 25                   | 50.0              |       |
| 94  | Y    | S    | K1807700-001      |                 | 125              | 125                  | 25                   |                   |       |
| 95  | X    | S    | K1807700-002      |                 | 125              | 125                  | 25                   |                   |       |
| 96  | Y    | S    | K1807762-007      |                 | 125              | 125                  | 25                   |                   |       |
| 97  | X    | S    | K1807597-002      |                 | 125              | 125                  | 25                   |                   |       |
| 98  | Y    | S    | K1807597-003      |                 | 125              | 125                  | 25                   |                   |       |
| 99  | X    | S    | K1807597-004      |                 | 125              | 125                  | 25                   |                   |       |

# Run Information Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/17/18

Analyst Name: Anna Boyer

| Run | Trap | Type         | Name/ID                 | Method<br>Blank | Sample<br>Vol/Wt | Dilution<br>Vol (ml) | Analyzed<br>Vol (ml) | Expected<br>Value | Notes |
|-----|------|--------------|-------------------------|-----------------|------------------|----------------------|----------------------|-------------------|-------|
| 100 | Y    | S            | K1807597-005            |                 | 125              | 125                  | 25                   |                   |       |
| 101 | X    | S            | K1807597-006            |                 | 125              | 125                  | 25                   |                   |       |
| 102 | Y    | S            | K1807597-007            |                 | 125              | 125                  | 25                   |                   |       |
| 103 | X    | MBA          | MB-3                    |                 | 125              | 125                  | 25                   |                   |       |
| 104 | Y    | OPR          | OPR-5                   |                 | 25               | 25                   | 25                   | 5.0               |       |
| 105 | X    | QCS          | QCS-1                   |                 | 125              | 125                  | 25                   | 5.0               |       |
| 106 | Y    | MBA          | MB-1                    |                 | 125              | 125                  | 25                   |                   |       |
| 107 | X    | <del>S</del> | <del>K1807798-001</del> |                 | <del>125</del>   | <del>125</del>       | <del>25</del>        |                   |       |
| 108 | Y    | MS           | K1807798-001            |                 | 125              | 125                  | 25                   | 50.0              |       |
| 109 | X    | MSD          | K1807798-001            |                 | 125              | 125                  | 25                   | 50.0              |       |
| 110 | Y    | S            | K1807798-001 DISS       |                 | 250              | 250                  | 25                   |                   |       |
| 111 | X    | S            | K1807782-001            |                 | 125              | 125                  | 25                   |                   |       |
| 112 | Y    | S            | K1807782-002            |                 | 125              | 125                  | 25                   |                   |       |
| 113 | X    | S            | K1807784-002            |                 | 125              | 125                  | 25                   |                   |       |
| 114 | Y    | S            | K1807784-003            |                 | 125              | 125                  | 25                   |                   |       |
| 115 | X    | S            | K1807784-004            |                 | 125              | 125                  | 25                   |                   |       |
| 116 | Y    | S            | K1807784-005            |                 | 125              | 125                  | 25                   |                   |       |
| 117 | X    | S            | K1807784-006            |                 | 125              | 125                  | 25                   |                   |       |
| 118 | Y    | <del>S</del> | <del>K1807784-007</del> |                 | <del>125</del>   | <del>125</del>       | <del>25</del>        |                   |       |
| 119 | X    | MBA          | MB-2                    |                 | 125              | 125                  | 25                   |                   |       |
| 120 | Y    | S            | K1807784-001            |                 | 125              | 125                  | 25                   |                   |       |
| 121 | X    | MS           | K1807784-001            |                 | 125              | 125                  | 25                   | 50.0              |       |
| 122 | Y    | MSD          | K1807784-001            |                 | 125              | 125                  | 25                   | 50.0              |       |
| 123 | X    | S            | K1807784-008            |                 | 125              | 125                  | 25                   |                   |       |
| 124 | Y    | S            | K1807784-009            |                 | 125              | 125                  | 25                   |                   |       |
| 125 | X    | S            | K1807784-010            |                 | 125              | 125                  | 25                   |                   |       |
| 126 | Y    | S            | K1807784-011            |                 | 125              | 125                  | 25                   |                   |       |
| 127 | X    | S            | K1807784-013            |                 | 125              | 125                  | 25                   |                   |       |
| 128 | Y    | MBA          | MB-3                    |                 | 125              | 125                  | 25                   |                   |       |
| 129 | X    | OPR          | OPR-6                   |                 | 25               | 25                   | 25                   | 5.0               |       |

AB  
8/20/18

## Metals Digestion Sheet

Service Requests:

Method : 1631E

Analysis for : CVAFS

| Sample            | StarLims # | Date Prepped | > BrCl | Prepared Initial Vol. (ml) | Prepared Final Vol. (ml) | Analyzed Vol. (ml) | Analyzed Dil. Vol. (ml) | Matrix    |
|-------------------|------------|--------------|--------|----------------------------|--------------------------|--------------------|-------------------------|-----------|
| Method Blank      |            | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| Method Blank      |            | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| OPR               |            |              | X      | 25                         | 25                       | 25                 | 25                      | 0.5% BrCl |
| QCS               |            | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807794-001      | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807794-001S     | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807794-001SD    | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807794-002      | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807794-003      | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807794-001 DISS | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807794-002 DISS | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807794-003 DISS | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807761-001      | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807761-002      | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807761-003      | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807705-001      | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807705-002      | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807705-002S     | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807705-002SD    | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807700-001      | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807700-002      | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807762-007      | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-002 ✓    | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-003 ✓    | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-004 ✓    | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-005 ✓    | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-006 ✓    | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-007 ✓    | 320056     | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| Method Blank      |            | 8/16/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| OPR               |            |              | X      | 25                         | 25                       | 25                 | 25                      | 0.5% BrCl |

AF2-35-K BrCl

Oxidation Start Time: 4:33pm 8/16/18 ✓

AF2-38-D (2.5 ng/mL) -----

QCS: 0.25mL

Digestion Completed: 4:33am 8/17/18

AF2-36-C (100 ng/L) -----

OPR: 1.25mL

1st MS / DMS: 0.125mL AF2-36-A 10ng/mL

2nd MS / DMS: 0.125mL AF2-36-A 10ng/mL

Comments:

Analyst

Annex Boyer

1631Dig.XLS  
2/8/2008

**ALS Group USA, Corp.**  
dba ALS Environmental  
Analytical Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** 08/17-22/18  
**Date Received:** 08/21-22/18

Mercury, Total

**Prep Method:** METHOD  
**Analysis Method:** 1631E  
**Test Notes:**

**Units:** ng/L  
**Basis:** NA

| Sample Name                             | Lab Code     | MRL | MDL  | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|-----------------------------------------|--------------|-----|------|-----------------|----------------|---------------|--------|--------------|
| Rinsate Blank-Northern Pike 8/17        | K1807597-008 | 0.5 | 0.06 | 1               | 08/23/18       | 08/24/18      | 0.09 ✓ | J            |
| Homogenization Blank-Northern Pike 8/17 | K1807597-009 | 0.5 | 0.06 | 1               | 08/23/18       | 08/24/18      | 0.11 ✓ | J            |
| Homogenization Blank-Northern Pike 8/17 | K1807597-010 | 0.5 | 0.06 | 1               | 08/23/18       | 08/24/18      | 0.13 ✓ | J            |
| Rinsate Blank-Northern Pike 8/21        | K1807597-011 | 0.5 | 0.06 | 1               | 08/23/18       | 08/24/18      | ND     |              |
| Homogenization Blank-Northern Pike 8/21 | K1807597-012 | 0.5 | 0.06 | 1               | 08/23/18       | 08/24/18      | 0.08 ✓ | J            |
| Homogenization Blank-Northern Pike 8/21 | K1807597-013 | 0.5 | 0.06 | 1               | 08/23/18       | 08/24/18      | 0.11 ✓ | J            |
| Method Blank 1                          | K1807597-MB1 | 0.5 | 0.06 | 1               | 08/23/18       | 08/24/18      | 0.07 ✓ | J            |
| Method Blank 2                          | K1807597-MB2 | 0.5 | 0.06 | 1               | 08/23/18       | 08/24/18      | 0.11 ✓ | J            |
| Method Blank 3                          | K1807597-MB3 | 0.5 | 0.06 | 1               | 08/23/18       | 08/24/18      | ND     |              |

*no blank qualification*

**ALS Group USA, Corp.**  
**dba ALS Environmental**  
**Analytical Report**

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** 08/22/18  
**Date Received:** 08/22/18

Mercury, Total

**Prep Method:** METHOD  
**Analysis Method:** 1631E  
**Test Notes:**

**Units:** ng/L  
**Basis:** NA

| Sample Name                             | Lab Code     | MRL | MDL  | Dilution<br>Factor | Date<br>Extracted | Date<br>Analyzed | Result | Result<br>Notes |
|-----------------------------------------|--------------|-----|------|--------------------|-------------------|------------------|--------|-----------------|
| Rinsate Blank-Northern Pike 8/22        | K1807597-014 | 0.5 | 0.06 | 1                  | 08/23/18          | 08/24/18         | 0.09 ✓ | J               |
| Homogenization Blank-Northern Pike 8/22 | K1807597-015 | 0.5 | 0.06 | 1                  | 08/23/18          | 08/24/18         | 0.14 ✓ | J               |
| Homogenization Blank-Northern Pike 8/22 | K1807597-016 | 0.5 | 0.06 | 1                  | 08/23/18          | 08/24/18         | 0.09 ✓ | J               |
| Method Blank 1                          | K1807597-MB1 | 0.5 | 0.06 | 1                  | 08/23/18          | 08/24/18         | ND     |                 |
| Method Blank 2                          | K1807597-MB2 | 0.5 | 0.06 | 1                  | 08/23/18          | 08/24/18         | ND     |                 |
| Method Blank 3                          | K1807597-MB3 | 0.5 | 0.06 | 1                  | 08/23/18          | 08/24/18         | ND     |                 |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/24/18

Ongoing Precision and Recovery (OPR) Sample Summary  
Total Metals

**Sample Name:** Ongoing Precision and Recovery (Initial)

**Units:** ng/L  
**Basis:** NA

**Test Notes:**

| Analyte | Prep Method | Analysis Method | True Value | Result | Percent Recovery | ALS Percent Recovery | Result Notes |
|---------|-------------|-----------------|------------|--------|------------------|----------------------|--------------|
|         |             |                 |            |        |                  | Acceptance Limits    |              |
| Mercury | METHOD      | 1631E           | 5.00       | 5.02 ✓ | 100 ✓            | 77-123               |              |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/24/18

Ongoing Precision and Recovery (OPR) Sample Summary  
Total Metals

**Sample Name:** Ongoing Precision and Recovery (Final) **Units:** ng/L  
**Basis:** NA

**Test Notes:**

| Analyte | Prep<br>Method | Analysis<br>Method | True<br>Value | Result | Percent<br>Recovery | ALS<br>Percent<br>Recovery | Result<br>Notes |
|---------|----------------|--------------------|---------------|--------|---------------------|----------------------------|-----------------|
|         |                |                    |               |        |                     | Acceptance<br>Limits       |                 |
| Mercury | METHOD         | 1631E              | 5.00          | 5.19 ✓ | 104 ✓               | 77-123                     |                 |



ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/24/18

Ongoing Precision and Recovery (OPR) Sample Summary  
Total Metals

Sample Name: Ongoing Precision and Recovery (Final) Units: ng/L  
Basis: NA

Test Notes:

| Analyte | Prep Method | Analysis Method | True Value | Result | Percent Recovery | ALS                                | Result Notes |
|---------|-------------|-----------------|------------|--------|------------------|------------------------------------|--------------|
|         |             |                 |            |        |                  | Percent Recovery Acceptance Limits |              |
| Mercury | METHOD      | 1631E           | 5.00       | 4.88 ✓ | 98 ✓             | 77-123                             |              |

**ALS Group USA, Corp.**  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 08/23/18  
**Date Analyzed:** 08/24/18

Quality Control Sample (QCS) Summary  
Total Metals

**Sample Name:** Quality Control Sample

**Units:** ng/L  
**Basis:** NA

**Test Notes:**

| Analyte | Prep<br>Method | Analysis<br>Method | True<br>Value | Result | Percent<br>Recovery | ALS<br>Percent<br>Recovery | Result<br>Notes |
|---------|----------------|--------------------|---------------|--------|---------------------|----------------------------|-----------------|
|         |                |                    |               |        |                     | Acceptance<br>Limits       |                 |
| Mercury | METHOD         | 1631E              | 5.00          | 5.02 ✓ | 100 ✓               | 77-123                     |                 |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 08/23/18  
**Date Analyzed:** 08/24/18

Quality Control Sample (QCS) Summary  
Total Metals

**Sample Name:** Quality Control Sample

**Units:** ng/L  
**Basis:** NA

**Test Notes:**

| Analyte | Prep Method | Analysis Method | True Value | Result | Percent Recovery | ALS Percent Recovery | Result Notes |
|---------|-------------|-----------------|------------|--------|------------------|----------------------|--------------|
|         |             |                 |            |        |                  | Acceptance Limits    |              |
| Mercury | METHOD      | 1631E           | 5.00       | 4.21 ✓ | 84 ✓             | 77-123               |              |

# QA Summary Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):  
Instrument ID: K-AFS-04

Date Analyzed: 8/24/18 ✓  
Analyst Name: Anna Boyer

| Calibration        |          |                 |       |             |         |             |        |           |        |
|--------------------|----------|-----------------|-------|-------------|---------|-------------|--------|-----------|--------|
| QA Sample Type     | Name/ID  | Analyzed Result | Units | Spike Level | % REC ✓ | % REC Limit | RSD    | RSD Limit | Notes  |
| Calibration        | 12.5 pg  | 11.8            | pg    | 12.5        | 94.7    | 75-125      |        |           | accept |
|                    | 25 pg    | 26.2            | pg    | 25          | 105     | 75-125      |        |           | accept |
|                    | 100 pg   | 97.4            | pg    | 100         | 97.4    | 75-125      |        |           | accept |
|                    | 500 pg   | 521             | pg    | 500         | 104     | 75-125      |        |           | accept |
|                    | 2500 pg  | 2,430           | pg    | 2500        | 97.0    | 75-125      |        |           | accept |
|                    | 10000 pg | 10,300          | pg    | 10000       | 103     | 75-125      |        |           | accept |
| Calibration Factor |          | 0.000103 ✓      | pg/PA |             |         |             | 4.33 ✓ | < 15      | accept |
| Calibration Date   |          | 8/24/18 ✓       |       |             |         |             |        |           |        |

# QA Summary Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/24/18

Analyst Name: Anna Boyer

| Blank Summary   |         |                 |       |          |        |             |        |
|-----------------|---------|-----------------|-------|----------|--------|-------------|--------|
| QA Sample Type  | Name/ID | Analyzed Result | Units | Criteria | StDev  | StDev Limit | Notes  |
| CB              | CB-1    | 2.60            | pg    | < 50     |        |             | accept |
|                 | CB-2    | 3.05            | pg    | < 50     |        |             | accept |
|                 | CB-3    | 2.62            | pg    | < 50     |        |             | accept |
|                 | CB-4    | 2.86            | pg    | < 50     |        |             | accept |
|                 | Average | 2.78            | pg    | < 25     | 0.211  | < 10        | accept |
| <i>PA 27116</i> |         |                 |       |          |        |             |        |
| MBA             | MB-1    | 0.0699 ✓        | ng/L  | < 0.5    |        |             | accept |
|                 | MB-2    | 0.114 ✓         | ng/L  | < 0.5    |        |             | accept |
|                 | MB-3    | 0.0573          | ng/L  | < 0.5 ✓  |        |             | accept |
|                 | MB-1    | 0.0580          | ng/L  | < 0.5 ✓  |        |             | accept |
|                 | MB-2    | 0.00328         | ng/L  | < 0.5 ✓  |        |             | accept |
|                 | MB-3    | 0.0385          | ng/L  | < 0.5 ✓  |        |             | accept |
|                 | MB-1    | 0.0902          | ng/L  | < 0.5    |        |             | accept |
|                 | MB-2    | 0.00727         | ng/L  | < 0.5    |        |             | accept |
|                 | MB-3    | 0.0841          | ng/L  | < 0.5    |        |             | accept |
|                 | Average | 0.0581          | ng/L  |          | 0.0370 |             |        |

QA Comments:

$$(PA - 27116)(0.000103) \cdot \frac{\sqrt{D}}{\sqrt{S} \cdot \sqrt{A}} = ng/L$$

# QA Summary Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/24/18

Analyst Name: Anna Boyer

| Bias and Precision |                   |              |       |             |               |        |             |      |           |        |
|--------------------|-------------------|--------------|-------|-------------|---------------|--------|-------------|------|-----------|--------|
| Type               | Name/ID           | Final Result | Units | Spike Level | Source Result | % REC  | % REC Limit | RPD  | RPD Limit | Notes  |
| MS                 | K1807919-001      | 51.1         | ng/L  | 50.0        | 2.99          | 96.2   | 71-125      |      |           | accept |
|                    | K1807919-001 DISS | 51.8         | ng/L  | 50.0        | 0.796         | 102    | 71-125      |      |           | accept |
|                    | K1807922-001      | 51.4         | ng/L  | 50.0        | 0.623         | 101    | 71-125      |      |           | accept |
|                    | K1807923-001      | 46.6         | ng/L  | 50.0        | 0.515         | 92.2   | 71-125      |      |           | accept |
|                    | K1808027-001      | 44.7         | ng/L  | 50.0        | 0.321         | 88.7   | 71-125      |      |           | accept |
| MSD                | K1807919-001      | 54.6         | ng/L  | 50.0        | 2.99          | 103    | 71-125      | 6.68 | < 24      | accept |
|                    | K1807919-001 DISS | 47.8         | ng/L  | 50.0        | 0.796         | 94.0   | 71-125      | 8.08 | < 24      | accept |
|                    | K1807922-001      | 47.7         | ng/L  | 50.0        | 0.623         | 94.2   | 71-125      | 7.32 | < 24      | accept |
|                    | K1807923-001      | 50.0         | ng/L  | 50.0        | 0.515         | 99.1   | 71-125      | 7.08 | < 24      | accept |
|                    | K1808027-001      | 51.4         | ng/L  | 50.0        | 0.321         | 102    | 71-125      | 14.0 | < 24      | accept |
| OPR                | OPR-1             | 5.02 ✓       | ng/L  | 5           |               | 100. ✓ | 77-123      |      |           | accept |
|                    | OPR-2             | 5.19 ✓       | ng/L  | 5.0         |               | 104 ✓  | 77-123      |      |           | accept |
|                    | OPR-3             | 4.88 ✓       | ng/L  | 5.0         |               | 97.6 ✓ | 77-123      |      |           | accept |
|                    | OPR-4             | 4.82         | ng/L  | 5.0         |               | 96.4   | 77-123      |      |           | accept |
| QCS                | QCS-1             | 5.02 ✓       | ng/L  | 5           |               | 100. ✓ | 77-123      |      |           | accept |
|                    | QCS-1             | 4.21 ✓       | ng/L  | 5.0         |               | 84.2 ✓ | 77-123      |      |           | accept |
|                    | QCS-1             | 4.81         | ng/L  | 5.0         |               | 96.1   | 77-123      |      |           | accept |

# Run Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/24/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID           | Method<br>Blank | Peak | Peak Area     | Analyzed Result<br>(pg) | Final Result<br>(ng/L) | QA Results | Criteria | Notes  |
|-----|------|------|-------------------|-----------------|------|---------------|-------------------------|------------------------|------------|----------|--------|
| 1   | X    | CCB  | RINSE             |                 | 1    | 45,829        | 1.92                    |                        | 1.92       | < 50     | accept |
| 2   | Y    | CCB  | RINSE             |                 | 1    | 30,631        | 0.361                   |                        | 0.361      | < 50     | accept |
| 3   | X    | CB   | CB-1              |                 | 1    | 25,335 ✓      | 2.60                    |                        | 2.60       | < 50     | accept |
| 4   | Y    | CB   | CB-2              |                 | 1    | 29,683 ✓      | 3.05                    |                        | 3.05       | < 50     | accept |
| 5   | X    | CB   | CB-3              |                 | 1    | 25,569 ✓      | 2.62                    |                        | 2.62       | < 50     | accept |
| 6   | Y    | CB   | CB-4              |                 | 1    | 27,878 ✓      | 2.86                    |                        | 2.86       | < 50     | accept |
| 7   | X    | STD  | 12.5 pg           |                 | 1    | 142,420 ✓     | 11.8                    |                        | 94.7       | 75-125   | accept |
| 8   | Y    | STD  | 25 pg             |                 | 1    | 282,505 ✓     | 26.2                    |                        | 105        | 75-125   | accept |
| 9   | X    | STD  | 100 pg            |                 | 1    | 975,533 ✓     | 97.4                    |                        | 97.4       | 75-125   | accept |
| 10  | Y    | STD  | 500 pg            |                 | 1    | 5,106,507 ✓   | 521                     |                        | 104        | 75-125   | accept |
| 11  | X    | STD  | 2500 pg           |                 | 1    | 23,658,456 ✓  | 2,430                   |                        | 97.0       | 75-125   | accept |
| 12  | Y    | STD  | 10000 pg          |                 | 1    | 100,117,153 ✓ | 10,300                  |                        | 103        | 75-125   | accept |
| 13  | X    | OPR  | OPR-1             |                 | 1    | 1,249,300 ✓   | 125 ✓                   | 5.02 ✓                 | 100.       | 77-123   | accept |
| 14  | Y    | QCS  | QCS-1             |                 | 1    | 1,249,470 ✓   | 125 ✓                   | 5.02 ✓                 | 100.       | 77-123   | accept |
| 15  | X    | MBA  | MB-1              |                 | 1    | 44,142 ✓      | 1.75 ✓                  | 0.0699 ✓               | 0.0699     | < 0.5    | accept |
| 16  | Y    | S    | LOD               |                 | 1    | 91,205        | 6.58                    | 0.263                  |            | < HS     | accept |
| 17  | X    | S    | LOQ               |                 | 1    | 260,618       | 24.0                    | 0.959                  |            | < HS     | accept |
| 18  | Y    | S    | K1807919-001      |                 | 1    | 754,661       | 74.7                    | 2.99                   |            | < HS     | accept |
| 19  | X    | MS   | K1807919-001      |                 | 1    | 12,467,284    | 1,280                   | 51.1                   | 96.2       | 71-125   | accept |
| 20  | Y    | MSD  | K1807919-001      |                 | 1    | 13,326,876    | 1,370                   | 54.6                   | 103        | 71-125   | accept |
| 21  | X    | S    | K1807919-002      |                 | 1    | 603,307       | 59.1                    | 2.37                   |            | < HS     | accept |
| 22  | Y    | S    | K1807919-003      |                 | 1    | 622,675       | 61.1                    | 2.45                   |            | < HS     | accept |
| 23  | X    | S    | K1807919-004      |                 | 1    | 1,098,603     | 110.                    | 4.40                   |            | < HS     | accept |
| 24  | Y    | S    | K1807919-005      |                 | 1    | 1,225,620     | 123                     | 4.92                   |            | < HS     | accept |
| 25  | X    | S    | K1807919-006      |                 | 1    | 1,281,241     | 129                     | 5.15                   |            | < HS     | accept |
| 26  | Y    | S    | K1807919-007      |                 | 1    | 647,913       | 63.7                    | 2.55                   |            | < HS     | accept |
| 27  | X    | S    | K1807919-002 DISS |                 | 1    | 196,064       | 17.3                    | 0.694                  |            | < HS     | accept |
| 28  | Y    | S    | K1807919-003 DISS |                 | 1    | 212,471       | 19.0                    | 0.761                  |            | < HS     | accept |
| 29  | X    | S    | K1807919-004 DISS |                 | 1    | 128,755       | 10.4                    | 0.417                  |            | < HS     | accept |
| 30  | Y    | MBA  | MB-2              |                 | 1    | 54,890 ✓      | 2.85 ✓                  | 0.114 ✓                | 0.114      | < 0.5    | accept |
| 31  | X    | S    | K1807919-001 DISS |                 | 1    | 220,965       | 19.9                    | 0.796                  |            | < HS     | accept |
| 32  | Y    | MS   | K1807919-001 DISS |                 | 3    | 12,643,070    | 1,290                   | 51.8                   | 102        | 71-125   | accept |
| 33  | X    | MSD  | K1807919-001 DISS |                 | 2    | 11,662,875    | 1,190                   | 47.8                   | 94.0       | 71-125   | accept |

# Run Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/24/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID                                 | Method<br>Blank | Peak | Peak Area   | Analyzed Result<br>(pg) | Final Result<br>(ng/L) | QA Results | Criteria | Notes  |
|-----|------|------|-----------------------------------------|-----------------|------|-------------|-------------------------|------------------------|------------|----------|--------|
| 34  | Y    | S    | K1807919-005 DISS                       |                 | 1    | 178,072     | 15.5                    | 0.620                  |            | < HS     | accept |
| 35  | X    | S    | K1807919-006 DISS                       |                 | 1    | 119,805     | 9.51                    | 0.381                  |            | < HS     | accept |
| 36  | Y    | S    | K1807919-007 DISS                       |                 | 1    | 265,050     | 24.4                    | 0.977                  |            | < HS     | accept |
| 37  | X    | S    | K1807597-008                            |                 | 1    | 50,022 ✓    | 2.35 ✓                  | 0.0940 ✓               |            | < HS     | accept |
| 38  | Y    | S    | K1807597-009                            |                 | 1    | 54,356 ✓    | 2.80 ✓                  | 0.112 ✓                |            | < HS     | accept |
| 39  | X    | S    | K1807597-010                            |                 | 1    | 59,267 ✓    | 3.30 ✓                  | 0.132 ✓                |            | < HS     | accept |
| 40  | Y    | S    | K1807597-011                            |                 | 1    | 34,836 ✓    | 0.792 ✓                 | 0.0317                 |            | < HS     | accept |
| 41  | X    | S    | K1807597-012                            |                 | 1    | 46,885 ✓    | 2.03 ✓                  | 0.0812 ✓               |            | < HS     | accept |
| 42  | Y    | S    | K1807597-013                            |                 | 1    | 54,138 ✓    | 2.77 ✓                  | 0.111 ✓                |            | < HS     | accept |
| 43  | X    | MBA  | MB-3                                    |                 | 1    | 41,071 ✓    | 1.43 ✓                  | 0.0573                 | 0.0573     | < 0.5    | accept |
| 44  | Y    | OPR  | OPR-2                                   |                 | 1    | 1,291,414 ✓ | 130. ✓                  | 5.19 ✓                 | 104        | 77-123   | accept |
| 45  | X    | QCS  | QCS-1                                   |                 | 2    | 1,053,063 ✓ | 105 ✓                   | 4.21 ✓                 | 84.2       | 77-123   | accept |
| 46  | Y    | MBA  | MB-1                                    |                 | 1    | 41,247 ✓    | 1.45 ✓                  | 0.0580                 | 0.0580     | < 0.5    | accept |
| 47  | X    | S    | K1807922-001                            |                 | 1    | 178,944     | 15.6                    | 0.623                  |            | < HS     | accept |
| 48  | Y    | MS   | K1807922-001                            |                 | 1    | 12,535,700  | 1,280                   | 51.4                   | 101        | 71-125   | accept |
| 49  | X    | MSD  | K1807922-001                            |                 | 1    | 11,652,055  | 1,190                   | 47.7                   | 94.2       | 71-125   | accept |
| 50  | Y    | S    | K1807922-003                            |                 | 1    | 502,466     | 48.8                    | 1.95                   |            | < HS     | accept |
| 51  | X    | S    | K1807920-001                            |                 | 1    | 84,414      | 5.88                    | 0.235                  |            | < HS     | accept |
| 52  | Y    | S    | K1807925-001                            |                 | 1    | 2,738,613   | 278                     | 11.1                   |            | < HS     | accept |
| 53  | X    | S    | K1808026-001                            |                 | 1    | 75,800      | 5.00                    | 0.200                  |            | < HS     | accept |
| 54  | Y    | S    | K1808024-001                            |                 | 1    | 9,493,054   | 972                     | 38.9                   |            | < HS     | accept |
| 55  | X    | S    | K1807597-014                            |                 | 3    | 50,191 ✓    | 2.37 ✓                  | 0.0947 ✓               |            | < HS     | accept |
| 56  | Y    | S    | K1807597-015                            |                 | 1    | 61,309 ✓    | 3.51 ✓                  | 0.140 ✓                |            | < HS     | accept |
| 57  | X    | S    | K1807597-016                            |                 | 1    | 49,157 ✓    | 2.26 ✓                  | 0.0905 ✓               |            | < HS     | accept |
| 58  | Y    | S    | K1807923-004                            |                 | 1    | 809,526     | 80.3                    | 3.21                   |            | < HS     | accept |
| 59  | X    | MBA  | MB-2                                    |                 | 1    | 27,914 ✓    | 0.0819 ✓                | 0.00328                | 0.00328    | < 0.5    | accept |
| 60  | Y    | S    | K1807923-001                            |                 | 1    | 152,526     | 12.9                    | 0.515                  |            | < HS     | accept |
| 61  | X    | MS   | K1807923-001                            |                 | 1    | 11,381,758  | 1,170                   | 46.6                   | 92.2       | 71-125   | accept |
| 62  | Y    | MSD  | K1807923-001                            |                 | 1    | 12,214,853  | 1,250                   | 50.0                   | 99.1       | 71-125   | accept |
| 63  | X    | S    | K1807923-005                            |                 | 1    | 122,468     | 9.79                    | 0.391                  |            | < HS     | accept |
| 64  | Y    | S    | K1808023-001                            |                 | 1    | 113,713     | 8.89                    | 0.356                  |            | < HS     | accept |
| 65  | X    | S    | K1808023-002                            |                 | 1    | 1,741,737   | 176                     | 7.04                   |            | < HS     | accept |
| 66  | Y    | S    | <del>K1807923-001</del><br>K1801128-001 |                 | 1    | 154,657     | 13.1                    | 0.524                  |            | < HS     | accept |

8/27/18

Page 2 of 37 (Complete Report)

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# Run Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/24/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID                                                                             | Method | Peak | Peak Area  | Analyzed Result | Final Result | QA Results | Criteria | Notes  |
|-----|------|------|-------------------------------------------------------------------------------------|--------|------|------------|-----------------|--------------|------------|----------|--------|
|     |      |      |                                                                                     | Blank  |      |            | (pg)            | (ng/L)       |            |          |        |
| 67  | X    | S    | <del>K18079238-002</del> <del>K1807125-002</del> <del>K1807125-002</del> AB 8/27/18 |        | 1    | 156,830    | 13.3            | 0.533        |            | < HS     | accept |
| 68  | Y    | MBA  | MB-3                                                                                |        | 1    | 36,489     | 0.962           | 0.0385       | 0.0385     | < 0.5    | accept |
| 69  | X    | OPR  | OPR-3                                                                               |        | 1    | 1,215,463  | 122             | 4.88         | 97.6       | 77-123   | accept |
| 70  | Y    | QCS  | QCS-1                                                                               |        | 1    | 1,197,648  | 120             | 4.81         | 96.1       | 77-123   | accept |
| 71  | X    | MBA  | MB-1                                                                                |        | 1    | 49,080     | 2.25            | 0.0902       | 0.0902     | < 0.5    | accept |
| 72  | Y    | S    | K1808027-001                                                                        |        | 1    | 105,413    | 8.04            | 0.321        |            | < HS     | accept |
| 73  | X    | MS   | K1808027-001                                                                        |        | 1    | 10,905,426 | 1,120           | 44.7         | 88.7       | 71-125   | accept |
| 74  | Y    | MSD  | K1808027-001                                                                        |        | 1    | 12,538,626 | 1,280           | 51.4         | 102        | 71-125   | accept |
| 75  | X    | S    | K1808027-002                                                                        |        | 1    | 112,801    | 8.80            | 0.352        |            | < HS     | accept |
| 76  | Y    | S    | K1808027-003                                                                        |        | 1    | 139,351    | 11.5            | 0.461        |            | < HS     | accept |
| 77  | X    | S    | K1808027-006                                                                        |        | 1    | 131,972    | 10.8            | 0.431        |            | < HS     | accept |
| 78  | Y    | S    | K1808027-008                                                                        |        | 1    | 86,545     | 6.10            | 0.244        |            | < HS     | accept |
| 79  | X    | S    | K1808027-010                                                                        |        | 1    | 213,696    | 19.2            | 0.766        |            | < HS     | accept |
| 80  | Y    | S    | K1808027-011                                                                        |        | 1    | 111,438    | 8.66            | 0.346        |            | < HS     | accept |
| 81  | X    | S    | K1808027-012                                                                        |        | 1    | 120,422    | 9.58            | 0.383        |            | < HS     | accept |
| 82  | Y    | S    | K1808027-013                                                                        |        | 1    | 119,335    | 9.47            | 0.379        |            | < HS     | accept |
| 83  | X    | MBA  | MB-2                                                                                |        | 1    | 28,886     | 0.182           | 0.00727      | 0.00727    | < 0.5    | accept |
| 84  | Y    | MBA  | MB-3                                                                                |        | 1    | 47,594     | 2.10            | 0.0841       | 0.0841     | < 0.5    | accept |
| 85  | X    | OPR  | OPR-4                                                                               |        | 1    | 1,201,080  | 121             | 4.82         | 96.4       | 77-123   | accept |

## Analyst Comments:

PMT: 520  
 OFFSET: 3,168  
 NOISE: 40  
 VOA Vial Lot # 8-039-001

# Run Information Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/24/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID           | Method<br>Blank | Sample<br>Vol/Wt | Dilution<br>Vol (ml) | Analyzed<br>Vol (ml) | Expected<br>Value | Notes |
|-----|------|------|-------------------|-----------------|------------------|----------------------|----------------------|-------------------|-------|
| 1   | X    | CCB  | RINSE             |                 |                  |                      |                      |                   |       |
| 2   | Y    | CCB  | RINSE             |                 |                  |                      |                      |                   |       |
| 3   | X    | CB   | CB-1              |                 |                  |                      |                      |                   |       |
| 4   | Y    | CB   | CB-2              |                 |                  |                      |                      |                   |       |
| 5   | X    | CB   | CB-3              |                 |                  |                      |                      |                   |       |
| 6   | Y    | CB   | CB-4              |                 |                  |                      |                      |                   |       |
| 7   | X    | STD  | 12.5 pg           |                 |                  |                      |                      | 12.5              |       |
| 8   | Y    | STD  | 25 pg             |                 |                  |                      |                      | 25                |       |
| 9   | X    | STD  | 100 pg            |                 |                  |                      |                      | 100               |       |
| 10  | Y    | STD  | 500 pg            |                 |                  |                      |                      | 500               |       |
| 11  | X    | STD  | 2500 pg           |                 |                  |                      |                      | 2500              |       |
| 12  | Y    | STD  | 10000 pg          |                 |                  |                      |                      | 10000             |       |
| 13  | X    | OPR  | OPR-1             |                 | 25               | 25                   | 25                   | 5                 |       |
| 14  | Y    | QCS  | QCS-1             |                 | 125              | 125                  | 25                   | 5                 |       |
| 15  | X    | MBA  | MB-1              |                 | 125              | 125                  | 25                   |                   |       |
| 16  | Y    | S    | LOD               |                 | 125              | 125                  | 25                   |                   |       |
| 17  | X    | S    | LOQ               |                 | 125              | 125                  | 25                   |                   |       |
| 18  | Y    | S    | K1807919-001      |                 | 125              | 125                  | 25                   |                   |       |
| 19  | X    | MS   | K1807919-001      |                 | 125              | 125                  | 25                   | 50.0              |       |
| 20  | Y    | MSD  | K1807919-001      |                 | 125              | 125                  | 25                   | 50.0              |       |
| 21  | X    | S    | K1807919-002      |                 | 125              | 125                  | 25                   |                   |       |
| 22  | Y    | S    | K1807919-003      |                 | 125              | 125                  | 25                   |                   |       |
| 23  | X    | S    | K1807919-004      |                 | 125              | 125                  | 25                   |                   |       |
| 24  | Y    | S    | K1807919-005      |                 | 125              | 125                  | 25                   |                   |       |
| 25  | X    | S    | K1807919-006      |                 | 125              | 125                  | 25                   |                   |       |
| 26  | Y    | S    | K1807919-007      |                 | 125              | 125                  | 25                   |                   |       |
| 27  | X    | S    | K1807919-002 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 28  | Y    | S    | K1807919-003 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 29  | X    | S    | K1807919-004 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 30  | Y    | MBA  | MB-2              |                 | 125              | 125                  | 25                   |                   |       |
| 31  | X    | S    | K1807919-001 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 32  | Y    | MS   | K1807919-001 DISS |                 | 125              | 125                  | 25                   | 50.0              |       |
| 33  | X    | MSD  | K1807919-001 DISS |                 | 125              | 125                  | 25                   | 50.0              |       |

# Run Information Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/24/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID                                 | Method<br>Blank | Sample<br>Vol/Wt | Dilution<br>Vol (ml) | Analyzed<br>Vol (ml) | Expected<br>Value | Notes |
|-----|------|------|-----------------------------------------|-----------------|------------------|----------------------|----------------------|-------------------|-------|
| 34  | Y    | S    | K1807919-005 DISS                       |                 | 125              | 125                  | 25                   |                   |       |
| 35  | X    | S    | K1807919-006 DISS                       |                 | 125              | 125                  | 25                   |                   |       |
| 36  | Y    | S    | K1807919-007 DISS                       |                 | 125              | 125                  | 25                   |                   |       |
| 37  | X    | S    | K1807597-008                            |                 | 125              | 125                  | 25                   |                   |       |
| 38  | Y    | S    | K1807597-009                            |                 | 125              | 125                  | 25                   |                   |       |
| 39  | X    | S    | K1807597-010                            |                 | 125              | 125                  | 25                   |                   |       |
| 40  | Y    | S    | K1807597-011                            |                 | 125              | 125                  | 25                   |                   |       |
| 41  | X    | S    | K1807597-012                            |                 | 125              | 125                  | 25                   |                   |       |
| 42  | Y    | S    | K1807597-013                            |                 | 125              | 125                  | 25                   |                   |       |
| 43  | X    | MBA  | MB-3                                    |                 | 125              | 125                  | 25                   |                   |       |
| 44  | Y    | OPR  | OPR-2                                   |                 | 25               | 25                   | 25                   | 5.0               |       |
| 45  | X    | QCS  | QCS-1                                   |                 | 125              | 125                  | 25                   | 5.0               |       |
| 46  | Y    | MBA  | MB-1                                    |                 | 125              | 125                  | 25                   |                   |       |
| 47  | X    | S    | K1807922-001                            |                 | 125              | 125                  | 25                   |                   |       |
| 48  | Y    | MS   | K1807922-001                            |                 | 125              | 125                  | 25                   | 50.0              |       |
| 49  | X    | MSD  | K1807922-001                            |                 | 125              | 125                  | 25                   | 50.0              |       |
| 50  | Y    | S    | K1807922-003                            |                 | 125              | 125                  | 25                   |                   |       |
| 51  | X    | S    | K1807920-001                            |                 | 125              | 125                  | 25                   |                   |       |
| 52  | Y    | S    | K1807925-001                            |                 | 125              | 125                  | 25                   |                   |       |
| 53  | X    | S    | K1808026-001                            |                 | 125              | 125                  | 25                   |                   |       |
| 54  | Y    | S    | K1808024-001                            |                 | 125              | 125                  | 25                   |                   |       |
| 55  | X    | S    | K1807597-014                            |                 | 125              | 125                  | 25                   |                   |       |
| 56  | Y    | S    | K1807597-015                            |                 | 125              | 125                  | 25                   |                   |       |
| 57  | X    | S    | K1807597-016                            |                 | 125              | 125                  | 25                   |                   |       |
| 58  | Y    | S    | K1807923-004                            |                 | 125              | 125                  | 25                   |                   |       |
| 59  | X    | MBA  | MB-2                                    |                 | 125              | 125                  | 25                   |                   |       |
| 60  | Y    | S    | K1807923-001                            |                 | 125              | 125                  | 25                   |                   |       |
| 61  | X    | MS   | K1807923-001                            |                 | 125              | 125                  | 25                   | 50.0              |       |
| 62  | Y    | MSD  | K1807923-001                            |                 | 125              | 125                  | 25                   | 50.0              |       |
| 63  | X    | S    | K1807923-005                            |                 | 125              | 125                  | 25                   |                   |       |
| 64  | Y    | S    | K1808023-001                            |                 | 125              | 125                  | 25                   |                   |       |
| 65  | X    | S    | K1808023-002                            |                 | 125              | 125                  | 25                   |                   |       |
| 66  | Y    | S    | <del>K1807923-001</del><br>K1807928-001 |                 | 125              | 125                  | 25                   |                   |       |

AB  
8/27/18

Page 2 of 3 (Run Information Report)

# Run Information Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/24/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID       | Method<br>Blank | Sample<br>Vol/Wt | Dilution<br>Vol (ml) | Analyzed<br>Vol (ml) | Expected<br>Value | Notes |
|-----|------|------|---------------|-----------------|------------------|----------------------|----------------------|-------------------|-------|
| 67  | X    | S    | K18070238-002 |                 | 125              | 125                  | 25                   |                   |       |
| 68  | Y    | MBA  | MB-3          |                 | 125              | 125                  | 25                   |                   |       |
| 69  | X    | OPR  | OPR-3         |                 | 25               | 25                   | 25                   | 5.0               |       |
| 70  | Y    | QCS  | QCS-1         |                 | 125              | 125                  | 25                   | 5.0               |       |
| 71  | X    | MBA  | MB-1          |                 | 125              | 125                  | 25                   |                   |       |
| 72  | Y    | S    | K1808027-001  |                 | 125              | 125                  | 25                   |                   |       |
| 73  | X    | MS   | K1808027-001  |                 | 125              | 125                  | 25                   | 50.0              |       |
| 74  | Y    | MSD  | K1808027-001  |                 | 125              | 125                  | 25                   | 50.0              |       |
| 75  | X    | S    | K1808027-002  |                 | 125              | 125                  | 25                   |                   |       |
| 76  | Y    | S    | K1808027-003  |                 | 125              | 125                  | 25                   |                   |       |
| 77  | X    | S    | K1808027-006  |                 | 125              | 125                  | 25                   |                   |       |
| 78  | Y    | S    | K1808027-008  |                 | 125              | 125                  | 25                   |                   |       |
| 79  | X    | S    | K1808027-010  |                 | 125              | 125                  | 25                   |                   |       |
| 80  | Y    | S    | K1808027-011  |                 | 125              | 125                  | 25                   |                   |       |
| 81  | X    | S    | K1808027-012  |                 | 125              | 125                  | 25                   |                   |       |
| 82  | Y    | S    | K1808027-013  |                 | 125              | 125                  | 25                   |                   |       |
| 83  | X    | MBA  | MB-2          |                 | 125              | 125                  | 25                   |                   |       |
| 84  | Y    | MBA  | MB-3          |                 | 125              | 125                  | 25                   |                   |       |
| 85  | X    | OPR  | OPR-4         |                 | 25               | 25                   | 25                   | 5.0               |       |

## Metals Digestion Sheet

Service Requests:

Method : 1631E

Analysis for : CVAFS

| Sample              | StarLims # | Date Prepped | > BrCl | Prepared Initial Vol. (ml) | Prepared Final Vol. (ml) | Analyzed Vol. (ml) | Analyzed Dil. Vol. (ml) | Matrix    |
|---------------------|------------|--------------|--------|----------------------------|--------------------------|--------------------|-------------------------|-----------|
| Method Blank        |            | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| Method Blank        |            | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| OPR                 |            |              | X      | 25                         | 25                       | 25                 | 25                      | 0.5% BrCl |
| QCS                 |            | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807919-001        | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807919-001S       | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807919-001SD      | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807919-002        | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807919-003        | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807919-004        | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807919-005        | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807919-006        | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807919-007        | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807919-001 DISS   | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807919-001S DISS  | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807919-001SD DISS | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807919-002 DISS   | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807919-003 DISS   | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807919-004 DISS   | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807919-005 DISS   | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807919-006 DISS   | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807919-007 DISS   | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-008 ✓      | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-009 ✓      | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-010 ✓      | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-011 ✓      | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-012 ✓      | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-013 ✓      | 320433     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| Method Blank        |            | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| OPR                 |            |              | X      | 25                         | 25                       | 25                 | 25                      | 0.5% BrCl |

AF2-35-K BrCl

Oxidation Start Time: 2:18pm 8/23/18

AF2-38-D (2.5 ng/mL) -----

QCS: 0.25mL

Digestion Completed: 2:18am 8/24/18

AF2-38-J (100 ng/L) -----

OPR: 1.25mL

1st MS / DMS: 0.125mL AF2-38-H 10ng/mL

2nd MS / DMS: 0.125mL AF2-38-H 10ng/mL

Comments:

Analyst

Anna Boyer

1631Dig.XLS  
2/8/2008

## Metals Digestion Sheet

Service Requests:

Method : 1631E

Analysis for : CVAFS

| Sample         | StarLims # | Date Prepped | > BrCl | Prepared Initial Vol. (ml) | Prepared Final Vol. (ml) | Analyzed Vol. (ml) | Analyzed Dil. Vol. (ml) | Matrix    |
|----------------|------------|--------------|--------|----------------------------|--------------------------|--------------------|-------------------------|-----------|
| Method Blank   |            | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| Method Blank   |            | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| OPR            |            |              | X      | 25                         | 25                       | 25                 | 25                      | 0.5% BrCl |
| QCS            |            | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807922-001   | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807922-001S  | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807922-001SD | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807922-003   | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807920-001   | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807925-001   | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1808026-001   | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1808024-001   | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-014 ✓ | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-015 ✓ | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-016 ✓ | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807923-001   | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807923-001S  | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807923-001SD | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807923-004   | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807923-005   | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1808023-001   | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1808023-002   | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807928-001   | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807928-002   | 320434     | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| Method Blank   |            | 8/23/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| OPR            |            |              | X      | 25                         | 25                       | 25                 | 25                      | 0.5% BrCl |

AF2-35-K BrCl

Oxidation Start Time: 2:20pm 8/23/18 ✓

AF2-38-D (2.5 ng/mL) -----

QCS: 0.25mL

Digestion Completed: 2:20am 8/24/18

AF2-38-J (100 ng/L) -----

OPR: 1.25mL

1st MS / DMS: 0.125mL AF2-38-H 10ng/mL  
 2nd MS / DMS: 0.125mL AF2-38-H 10ng/mL

Comments:

Analyst

Anna Bayler

1631Dig.XLS

2/8/2008

ALS Group USA, Corp.  
dba ALS Environmental  
Analytical Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** 08/24/18  
**Date Received:** 08/24/18

Mercury, Total

**Prep Method:** METHOD  
**Analysis Method:** 1631E  
**Test Notes:**

**Units:** ng/L  
**Basis:** NA

| Sample Name                             | Lab Code     | MRL | MDL  | Dilution<br>Factor | Date<br>Extracted | Date<br>Analyzed | Result | Result<br>Notes |
|-----------------------------------------|--------------|-----|------|--------------------|-------------------|------------------|--------|-----------------|
| Rinsate Blank-Northern Pike 8/24        | K1807597-017 | 0.5 | 0.06 | 1                  | 08/28/18          | 08/29/18         | 0.16 ✓ | J               |
| Homogenization Blank-Northern Pike 8/24 | K1807597-018 | 0.5 | 0.06 | 1                  | 08/28/18          | 08/29/18         | 0.08 ✓ | J               |
| Homogenization Blank-Northern Pike 8/24 | K1807597-019 | 0.5 | 0.06 | 1                  | 08/28/18          | 08/29/18         | 0.09 ✓ | J               |
| Method Blank 1                          | K1807597-MB1 | 0.5 | 0.06 | 1                  | 08/28/18          | 08/29/18         | 0.06 ✓ | J               |
| Method Blank 2                          | K1807597-MB2 | 0.5 | 0.06 | 1                  | 08/28/18          | 08/29/18         | ND     |                 |
| Method Blank 3                          | K1807597-MB3 | 0.5 | 0.06 | 1                  | 08/28/18          | 08/29/18         | ND     |                 |

*no blank qualification*

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/29/18

Ongoing Precision and Recovery (OPR) Sample Summary  
Total Metals

**Sample Name:** Ongoing Precision and Recovery (Initial)

**Units:** ng/L  
**Basis:** NA

**Test Notes:**

| Analyte | Prep<br>Method | Analysis<br>Method | True<br>Value | Result | Percent<br>Recovery | ALS<br>Percent<br>Recovery | Result<br>Notes |
|---------|----------------|--------------------|---------------|--------|---------------------|----------------------------|-----------------|
|         |                |                    |               |        |                     | Acceptance<br>Limits       |                 |
| Mercury | METHOD         | 1631E              | 5.00          | 5.25 ✓ | 105 ✓               | 77-123                     |                 |



**ALS Group USA, Corp.**  
**dba ALS Environmental**  
**QA/QC Report**

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/29/18

Ongoing Precision and Recovery (OPR) Sample Summary  
 Total Metals

**Sample Name:** Ongoing Precision and Recovery (Final) **Units:** ng/L  
**Basis:** NA

**Test Notes:**

| Analyte | Prep Method | Analysis Method | True Value | Result | Percent Recovery | ALS Percent Recovery | Result Notes |
|---------|-------------|-----------------|------------|--------|------------------|----------------------|--------------|
|         |             |                 |            |        |                  | Acceptance Limits    |              |
| Mercury | METHOD      | 1631E           | 5.00       | 4.94 ✓ | 99 ✓             | 77-123               |              |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 08/28/18  
**Date Analyzed:** 08/29/18

Quality Control Sample (QCS) Summary  
Total Metals

**Sample Name:** Quality Control Sample

**Units:** ng/L  
**Basis:** NA

**Test Notes:**

| Analyte | Prep<br>Method | Analysis<br>Method | True<br>Value | Result | Percent<br>Recovery | ALS<br>Percent<br>Recovery | Result<br>Notes |
|---------|----------------|--------------------|---------------|--------|---------------------|----------------------------|-----------------|
|         |                |                    |               |        |                     | Acceptance<br>Limits       |                 |
| Mercury | METHOD         | 1631E              | 5.00          | 4.33 ✓ | 87 ✓                | 77-123                     |                 |

## QA Summary Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/29/18 ✓

Analyst Name: Anna Boyer

| Calibration        |          |                 |       |             |            |             |        |           |        |
|--------------------|----------|-----------------|-------|-------------|------------|-------------|--------|-----------|--------|
| QA Sample Type     | Name/ID  | Analyzed Result | Units | Spike Level | % REC<br>✓ | % REC Limit | RSD    | RSD Limit | Notes  |
| Calibration        | 12.5 pg  | 12.1            | pg    | 12.5        | 96.6       | 75-125      |        |           | accept |
|                    | 25 pg    | 26.1            | pg    | 25          | 105        | 75-125      |        |           | accept |
|                    | 100 pg   | 96.9            | pg    | 100         | 96.9       | 75-125      |        |           | accept |
|                    | 500 pg   | 518             | pg    | 500         | 104        | 75-125      |        |           | accept |
|                    | 2500 pg  | 2,420           | pg    | 2500        | 96.8       | 75-125      |        |           | accept |
|                    | 10000 pg | 10,200          | pg    | 10000       | 102        | 75-125      |        |           | accept |
| Calibration Factor |          | 0.000102 ✓      | pg/PA |             |            |             | 3.74 ✓ | < 15      | accept |
| Calibration Date   |          | 8/29/18 ✓       |       |             |            |             |        |           |        |

# QA Summary Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/29/18

Analyst Name: Anna Boyer

| Blank Summary  |          |                 |       |          |        |             |        |
|----------------|----------|-----------------|-------|----------|--------|-------------|--------|
| QA Sample Type | Name/ID  | Analyzed Result | Units | Criteria | StDev  | StDev Limit | Notes  |
| CB             | CB-1     | 2.72            | pg    | < 50     |        |             | accept |
|                | CB-2     | 3.55            | pg    | < 50     |        |             | accept |
|                | CB-3     | 2.74            | pg    | < 50     |        |             | accept |
|                | CB-4     | 3.05            | pg    | < 50     |        |             | accept |
| Average        | PA 29624 | 3.02            | pg    | < 25     | 0.384  | < 10        | accept |
| MBA            | MB-1     | 0.0520          | ng/L  | < 0.5    |        |             | accept |
|                | MB-2     | 0.0706          | ng/L  | < 0.5    |        |             | accept |
|                | MB-3     | 0.0642          | ng/L  | < 0.5    |        |             | accept |
|                | MB-1     | 0.0598          | ng/L  | < 0.5    |        |             | accept |
|                | MB-2     | 0.00510         | ng/L  | < 0.5    |        |             | accept |
|                | MB-3     | 0.0486          | ng/L  | < 0.5    |        |             | accept |
|                | MB-1     | 0.0374          | ng/L  | < 0.5    |        |             | accept |
|                | MB-2     | 0.0245          | ng/L  | < 0.5    |        |             | accept |
|                | MB-3     | 0.0613          | ng/L  | < 0.5    |        |             | accept |
| Average        |          | 0.0471          | ng/L  |          | 0.0212 |             |        |

QA Comments:

$$(PA - 29624)(0.000102) \cdot \frac{\sqrt{D}}{\sqrt{S} \cdot \sqrt{A}} = ng/L$$

# QA Summary Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/29/18

Analyst Name: Anna Boyer

| Bias and Precision |              |              |       |             |               |        |             |      |           |        |
|--------------------|--------------|--------------|-------|-------------|---------------|--------|-------------|------|-----------|--------|
| Type               | Name/ID      | Final Result | Units | Spike Level | Source Result | % REC  | % REC Limit | RPD  | RPD Limit | Notes  |
| MS                 | K1808081-001 | 50.2         | ng/L  | 50.0        | 2.95          | 94.5   | 71-125      |      |           | accept |
|                    | K1808165-001 | 53.2         | ng/L  | 50.0        | 0.558         | 105    | 71-125      |      |           | accept |
|                    | K1808171-001 | 52.2         | ng/L  | 50.0        | 0.397         | 104    | 71-125      |      |           | accept |
|                    | K1807551-002 | 90.0         | ng/L  | 91.5        | 2.60          | 95.5   | 71-125      |      |           | accept |
| MSD                | K1808081-001 | 54.2         | ng/L  | 50.0        | 2.95          | 103    | 71-125      | 7.71 | < 24      | accept |
|                    | K1808165-001 | 48.5         | ng/L  | 50.0        | 0.558         | 95.9   | 71-125      | 9.26 | < 24      | accept |
|                    | K1808171-001 | 47.8         | ng/L  | 50.0        | 0.397         | 94.9   | 71-125      | 8.72 | < 24      | accept |
|                    | K1807551-002 | 92.4         | ng/L  | 89.9        | 2.60          | 99.9   | 71-125      | 2.65 | < 24      | accept |
| OPR                | OPR-1        | 5.03         | ng/L  | 5           |               | 101    | 77-123      |      |           | accept |
|                    | OPR-2        | 5.25 ✓       | ng/L  | 5.0         |               | 105 ✓  | 77-123      |      |           | accept |
|                    | OPR/VER-3    | 5.19         | ng/L  | 5.0         |               | 104    | 77-123      |      |           | accept |
|                    | OPR-1        | 4.94 ✓       | ng/L  | 5.0         |               | 98.8 ✓ | 77-123      |      |           | accept |
|                    | OPR-2        | 5.26         | ng/L  | 5.0         |               | 105    | 77-123      |      |           | accept |
|                    | VER-4        | 4.70         | ng/L  | 5.0         |               | 94.0   | 77-123      |      |           | accept |
| QCS                | QCS-1        | 5.13         | ng/L  | 5           |               | 103    | 77-123      |      |           | accept |
|                    | QCS-1        | 4.33 ✓       | ng/L  | 5.0         |               | 86.6 ✓ | 77-123      |      |           | accept |
|                    | QCS-1        | 5.33         | ng/L  | 5.0         |               | 107    | 77-123      |      |           | accept |
|                    | SRM 2702     | 398          | ng/L  | 447         |               | 89.1   | 77-123      |      |           | accept |

# Run Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/29/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID           | Method<br>Blank | Peak | Peak Area     | Analyzed Result<br>(pg) | Final Result<br>(ng/L) | QA Results | Criteria | Notes  |
|-----|------|------|-------------------|-----------------|------|---------------|-------------------------|------------------------|------------|----------|--------|
| 1   | X    | CCB  | RINSE             |                 | 1    | 51,893        | 2.27                    |                        | 2.27       | < 50     | accept |
| 2   | Y    | CCB  | RINSE             |                 | 1    | 33,200        | 0.364                   |                        | 0.364      | < 50     | accept |
| 3   | X    | CB   | CB-1              |                 | 1    | 26,751 ✓      | 2.72                    |                        | 2.72       | < 50     | accept |
| 4   | Y    | CB   | CB-2              |                 | 1    | 34,822 ✓      | 3.55                    |                        | 3.55       | < 50     | accept |
| 5   | X    | CB   | CB-3              |                 | 1    | 26,922 ✓      | 2.74                    |                        | 2.74       | < 50     | accept |
| 6   | Y    | CB   | CB-4              |                 | 1    | 30,000 ✓      | 3.05                    |                        | 3.05       | < 50     | accept |
| 7   | X    | STD  | 12.5 pg           |                 | 1    | 148,169 ✓     | 12.1                    |                        | 96.6       | 75-125   | accept |
| 8   | Y    | STD  | 25 pg             |                 | 1    | 286,298 ✓     | 26.1                    |                        | 105        | 75-125   | accept |
| 9   | X    | STD  | 100 pg            |                 | 1    | 981,463 ✓     | 96.9                    |                        | 96.9       | 75-125   | accept |
| 10  | Y    | STD  | 500 pg            |                 | 1    | 5,112,851 ✓   | 518                     |                        | 104        | 75-125   | accept |
| 11  | X    | STD  | 2500 pg           |                 | 1    | 23,791,245 ✓  | 2,420                   |                        | 96.8       | 75-125   | accept |
| 12  | Y    | STD  | 10000 pg          |                 | 1    | 100,622,679 ✓ | 10,200                  |                        | 102        | 75-125   | accept |
| 13  | X    | OPR  | OPR-1             |                 | 1    | 1,264,124 ✓   | 126                     | 5.03                   | 101        | 77-123   | accept |
| 14  | Y    | QCS  | QCS-1             |                 | 1    | 1,288,371 ✓   | 128                     | 5.13                   | 103        | 77-123   | accept |
| 15  | X    | MBA  | MB-1              |                 | 1    | 42,392        | 1.30                    | 0.0520                 | 0.0520     | < 0.5    | accept |
| 16  | Y    | S    | K1808081-001      |                 | 1    | 753,726       | 73.7                    | 2.95                   |            | < HS     | accept |
| 17  | X    | MS   | K1808081-001      |                 | 1    | 12,354,759    | 1,250                   | 50.2                   | 94.5       | 71-125   | accept |
| 18  | Y    | MSD  | K1808081-001      |                 | 1    | 13,343,634    | 1,360                   | 54.2                   | 103        | 71-125   | accept |
| 19  | X    | S    | K1808081-002      |                 | 1    | 6,414,332     | 650.                    | 26.0                   |            | < HS     | accept |
| 20  | Y    | S    | K1808081-003      |                 | 1    | 601,521       | 58.2                    | 2.33                   |            | < HS     | accept |
| 21  | X    | S    | K1808081-004      |                 | 1    | 578,322       | 55.9                    | 2.23                   |            | < HS     | accept |
| 22  | Y    | S    | K1808081-005      |                 | 1    | 719,969       | 70.3                    | 2.81                   |            | < HS     | accept |
| 23  | X    | S    | K1808089-001      |                 | 1    | 43,695,075    | 4,450                   | 178                    |            | < HS     | accept |
| 24  | Y    | S    | K1808089-007      |                 | 1    | 510,720       | 49.0                    | 1.96                   |            | < HS     | accept |
| 25  | X    | S    | K1808088-007      |                 | 1    | 14,977,411    | 1,520                   | 60.9                   |            | < HS     | accept |
| 26  | Y    | S    | K1808088-008      |                 | 1    | 6,302,415     | 639                     | 25.5                   |            | < HS     | accept |
| 27  | X    | S    | K1808088-009 DISS |                 | 1    | 3,818,997     | 386                     | 15.4                   |            | < HS     | accept |
| 28  | Y    | MBA  | MB-2              |                 | 1    | 46,968        | 1.77                    | 0.0706                 | 0.0706     | < 0.5    | accept |
| 29  | X    | S    | K1808165-001      |                 | 1    | 166,726       | 14.0                    | 0.558                  |            | < HS     | accept |
| 30  | Y    | MS   | K1808165-001      |                 | 1    | 13,095,622    | 1,330                   | 53.2                   | 105        | 71-125   | accept |
| 31  | X    | MSD  | K1808165-001      |                 | 1    | 11,938,730    | 1,210                   | 48.5                   | 95.9       | 71-125   | accept |
| 32  | Y    | S    | K1808088-010 DISS |                 | 1    | 4,923,998     | 498                     | 19.9                   |            | < HS     | accept |
| 33  | X    | S    | K1808088-017      |                 | 1    | 15,857,197    | 1,610                   | 64.5                   |            | < HS     | accept |

# Run Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/29/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID           | Method<br>Blank | Peak | Peak Area   | Analyzed Result<br>(pg) | Final Result<br>(ng/L) | QA Results | Criteria | Notes  |
|-----|------|------|-------------------|-----------------|------|-------------|-------------------------|------------------------|------------|----------|--------|
| 34  | Y    | S    | K1808088-018      |                 | 1    | 12,939,979  | 1,310                   | 52.6                   |            | < HS     | accept |
| 35  | X    | S    | K1808088-019 DISS |                 | 1    | 6,157,242   | 624                     | 25.0                   |            | < HS     | accept |
| 36  | Y    | S    | K1808088-020 DISS |                 | 1    | 2,666,200   | 268                     | 10.7                   |            | < HS     | accept |
| 37  | X    | S    | K1808088-027      |                 | 1    | 14,034,945  | 1,430                   | 57.0                   |            | < HS     | accept |
| 38  | Y    | S    | K1808088-028      |                 | 1    | 6,416,835   | 650.                    | 26.0                   |            | < HS     | accept |
| 39  | X    | S    | K1808088-029 DISS |                 | 1    | 4,368,633   | 442                     | 17.7                   |            | < HS     | accept |
| 40  | Y    | S    | K1808088-030 DISS |                 | 1    | 4,057,885   | 410.                    | 16.4                   |            | < HS     | accept |
| 41  | X    | MBA  | MB-3              |                 | 1    | 45,380      | 1.60                    | 0.0642                 | 0.0642     | < 0.5    | accept |
| 42  | Y    | OPR  | OPR-2             |                 | 1    | 1,318,920 ✓ | 131 ✓                   | 5.25 ✓                 | 105        | 77-123   | accept |
| 43  | X    | QCS  | QCS-1             |                 | 1    | 1,092,739 ✓ | 108 ✓                   | 4.33 ✓                 | 86.6       | 77-123   | accept |
| 44  | Y    | MBA  | MB-1              |                 | 1    | 44,308 ✓    | 1.50 ✓                  | 0.0598 ✓               | 0.0598     | < 0.5    | accept |
| 45  | X    | S    | K1808171-001      |                 | 1    | 127,056     | 9.92                    | 0.397                  |            | < HS     | accept |
| 46  | Y    | MS   | K1808171-001      |                 | 1    | 12,846,053  | 1,300                   | 52.2                   | 104        | 71-125   | accept |
| 47  | X    | MSD  | K1808171-001      |                 | 1    | 11,775,172  | 1,200                   | 47.8                   | 94.9       | 71-125   | accept |
| 48  | Y    | S    | K1808153-003      |                 | 1    | 4,243,853   | 429                     | 17.2                   |            | < HS     | accept |
| 49  | X    | S    | K1808153-004      |                 | 1    | 561,068     | 54.1                    | 2.16                   |            | < HS     | accept |
| 50  | Y    | S    | K1808153-005      |                 | 1    | 104,470     | 7.62                    | 0.305                  |            | < HS     | accept |
| 51  | X    | S    | K1808153-006      |                 | 1    | 89,279      | 6.07                    | 0.243                  |            | < HS     | accept |
| 52  | Y    | S    | K1807597-017      |                 | 1    | 69,135 ✓    | 4.02 ✓                  | 0.161 ✓                |            | < HS     | accept |
| 53  | X    | S    | K1807597-018      |                 | 1    | 49,526 ✓    | 2.03 ✓                  | 0.0811 ✓               |            | < HS     | accept |
| 54  | Y    | S    | K1807597-019      |                 | 1    | 50,732 ✓    | 2.15 ✓                  | 0.0860 ✓               |            | < HS     | accept |
| 55  | X    | MBA  | MB-2              |                 | 1    | 30,875 ✓    | 0.127 ✓                 | 0.00510                | 0.00510    | < 0.5 ✓  | accept |
| 56  | Y    | S    | NH2OH Chk         |                 | 1    | 31,574      | 0.199                   | 0.00794                |            | < HS     | accept |
| 57  | X    | S    | NH2OH Chk         |                 | 1    | 26,262      | -0.342                  | -0.0137                |            | < HS     | accept |
| 58  | Y    | S    | NH2OH Chk         |                 | 1    | 29,694      | 0.00715                 | 0.000286               |            | < HS     | accept |
| 59  | X    | MBA  | MB-3              |                 | 1    | 41,547 ✓    | 1.21 ✓                  | 0.0486                 | 0.0486     | < 0.5 ✓  | accept |
| 60  | Y    | OPR  | OPR/VER-3         |                 | 1    | 1,304,395   | 130.                    | 5.19                   | 104        | 77-123   | accept |
| 61  | X    | OPR  | OPR-1             |                 | 1    | 2,455,779 ✓ | 247 ✓                   | 4.94 ✓                 | 98.8       | 77-123   | accept |
| 62  | Y    | MBA  | MB-1              |                 | 1    | 47,971      | 1.87                    | 0.0374                 | 0.0374     | < 0.5    | accept |
| 63  | X    | MBA  | MB-2              |                 | 1    | 41,662      | 1.23                    | 0.0245                 | 0.0245     | < 0.5    | accept |
| 64  | Y    | QCS  | QCS-1             |                 | 1    | 2,646,559   | 266                     | 5.33                   | 107        | 77-123   | accept |
| 65  | X    | QCS  | SRM 2702          |                 | 1    | 19,981,999  | 2,030                   | 398                    | 89.1       | 77-123   | accept |
| 66  | Y    | S    | K1807551-002      |                 | 1    | 1,436,467   | 143                     | 2.60                   |            | < HS     | accept |

# Run Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/29/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID      | Method<br>Blank | Peak | Peak Area  | Analyzed Result<br>(pg) | Final Result<br>(ng/L) | QA Results | Criteria | Notes  |
|-----|------|------|--------------|-----------------|------|------------|-------------------------|------------------------|------------|----------|--------|
| 67  | X    | MS   | K1807551-002 |                 | 1    | 48,332,170 | 4,920                   | 90.0                   | 95.5       | 71-125   | accept |
| 68  | Y    | MSD  | K1807551-002 |                 | 1    | 50,537,938 | 5,140                   | 92.4                   | 99.9       | 71-125   | accept |
| 69  | X    | S    | K1807551-001 |                 | 1    | 30,680,712 | 3,120                   | 54.6                   |            | < HS     | accept |
| 70  | Y    | S    | K1807551-003 |                 | 1    | 22,303,534 | 2,270                   | 37.0                   |            | < HS     | accept |
| 71  | X    | S    | K1807985-003 |                 | 1    | 22,850,244 | 2,320                   | 531                    |            | < HS     | accept |
| 72  | X    | MBA  | MB-3         |                 | 1    | 59,731     | 3.07                    | 0.0613                 | 0.0613     | < 0.5    | accept |
| 73  | Y    | OPR  | OPR-2        |                 | 1    | 2,612,819  | 263                     | 5.26                   | 105        | 77-123   | accept |
| 74  | X    | OPR  | VER-4        |                 | 1    | 1,183,604  | 117                     | 4.70                   | 94.0       | 77-123   | accept |

## Analyst Comments:

PMT: 521  
 OFFSET: 3,153  
 NOISE: 76  
 VOA Vial Lot # 8-039-001



# Run Information Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/29/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID           | Method<br>Blank | Sample<br>Vol/Wt | Dilution<br>Vol (ml) | Analyzed<br>Vol (ml) | Expected<br>Value | Notes |
|-----|------|------|-------------------|-----------------|------------------|----------------------|----------------------|-------------------|-------|
| 1   | X    | CCB  | RINSE             |                 |                  |                      |                      |                   |       |
| 2   | Y    | CCB  | RINSE             |                 |                  |                      |                      |                   |       |
| 3   | X    | CB   | CB-1              |                 |                  |                      |                      |                   |       |
| 4   | Y    | CB   | CB-2              |                 |                  |                      |                      |                   |       |
| 5   | X    | CB   | CB-3              |                 |                  |                      |                      |                   |       |
| 6   | Y    | CB   | CB-4              |                 |                  |                      |                      |                   |       |
| 7   | X    | STD  | 12.5 pg           |                 |                  |                      |                      | 12.5              |       |
| 8   | Y    | STD  | 25 pg             |                 |                  |                      |                      | 25                |       |
| 9   | X    | STD  | 100 pg            |                 |                  |                      |                      | 100               |       |
| 10  | Y    | STD  | 500 pg            |                 |                  |                      |                      | 500               |       |
| 11  | X    | STD  | 2500 pg           |                 |                  |                      |                      | 2500              |       |
| 12  | Y    | STD  | 10000 pg          |                 |                  |                      |                      | 10000             |       |
| 13  | X    | OPR  | OPR-1             |                 | 25               | 25                   | 25                   | 5                 |       |
| 14  | Y    | QCS  | QCS-1             |                 | 125              | 125                  | 25                   | 5                 |       |
| 15  | X    | MBA  | MB-1              |                 | 125              | 125                  | 25                   |                   |       |
| 16  | Y    | S    | K1808081-001      |                 | 125              | 125                  | 25                   |                   |       |
| 17  | X    | MS   | K1808081-001      |                 | 125              | 125                  | 25                   | 50.0              |       |
| 18  | Y    | MSD  | K1808081-001      |                 | 125              | 125                  | 25                   | 50.0              |       |
| 19  | X    | S    | K1808081-002      |                 | 125              | 125                  | 25                   |                   |       |
| 20  | Y    | S    | K1808081-003      |                 | 125              | 125                  | 25                   |                   |       |
| 21  | X    | S    | K1808081-004      |                 | 125              | 125                  | 25                   |                   |       |
| 22  | Y    | S    | K1808081-005      |                 | 125              | 125                  | 25                   |                   |       |
| 23  | X    | S    | K1808089-001      |                 | 125              | 125                  | 25                   |                   |       |
| 24  | Y    | S    | K1808089-007      |                 | 125              | 125                  | 25                   |                   |       |
| 25  | X    | S    | K1808088-007      |                 | 125              | 125                  | 25                   |                   |       |
| 26  | Y    | S    | K1808088-008      |                 | 125              | 125                  | 25                   |                   |       |
| 27  | X    | S    | K1808088-009 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 28  | Y    | MBA  | MB-2              |                 | 125              | 125                  | 25                   |                   |       |
| 29  | X    | S    | K1808165-001      |                 | 125              | 125                  | 25                   |                   |       |
| 30  | Y    | MS   | K1808165-001      |                 | 125              | 125                  | 25                   | 50.0              |       |
| 31  | X    | MSD  | K1808165-001      |                 | 125              | 125                  | 25                   | 50.0              |       |
| 32  | Y    | S    | K1808088-010 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 33  | X    | S    | K1808088-017      |                 | 125              | 125                  | 25                   |                   |       |

# Run Information Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/29/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID           | Method<br>Blank | Sample<br>Vol/Wt | Dilution<br>Vol (ml) | Analyzed<br>Vol (ml) | Expected<br>Value | Notes |
|-----|------|------|-------------------|-----------------|------------------|----------------------|----------------------|-------------------|-------|
| 34  | Y    | S    | K1808088-018      |                 | 125              | 125                  | 25                   |                   |       |
| 35  | X    | S    | K1808088-019 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 36  | Y    | S    | K1808088-020 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 37  | X    | S    | K1808088-027      |                 | 125              | 125                  | 25                   |                   |       |
| 38  | Y    | S    | K1808088-028      |                 | 125              | 125                  | 25                   |                   |       |
| 39  | X    | S    | K1808088-029 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 40  | Y    | S    | K1808088-030 DISS |                 | 125              | 125                  | 25                   |                   |       |
| 41  | X    | MBA  | MB-3              |                 | 125              | 125                  | 25                   |                   |       |
| 42  | Y    | OPR  | OPR-2             |                 | 25               | 25                   | 25                   | 5.0               |       |
| 43  | X    | QCS  | QCS-1             |                 | 125              | 125                  | 25                   | 5.0               |       |
| 44  | Y    | MBA  | MB-1              |                 | 125              | 125                  | 25                   |                   |       |
| 45  | X    | S    | K1808171-001      |                 | 125              | 125                  | 25                   |                   |       |
| 46  | Y    | MS   | K1808171-001      |                 | 125              | 125                  | 25                   | 50.0              |       |
| 47  | X    | MSD  | K1808171-001      |                 | 125              | 125                  | 25                   | 50.0              |       |
| 48  | Y    | S    | K1808153-003      |                 | 125              | 125                  | 25                   |                   |       |
| 49  | X    | S    | K1808153-004      |                 | 125              | 125                  | 25                   |                   |       |
| 50  | Y    | S    | K1808153-005      |                 | 125              | 125                  | 25                   |                   |       |
| 51  | X    | S    | K1808153-006      |                 | 125              | 125                  | 25                   |                   |       |
| 52  | Y    | S    | K1807597-017      |                 | 125              | 125                  | 25                   |                   |       |
| 53  | X    | S    | K1807597-018      |                 | 125              | 125                  | 25                   |                   |       |
| 54  | Y    | S    | K1807597-019      |                 | 125              | 125                  | 25                   |                   |       |
| 55  | X    | MBA  | MB-2              |                 | 125              | 125                  | 25                   |                   |       |
| 56  | Y    | S    | NH2OH Chk         |                 | 25               | 25                   | 25                   |                   |       |
| 57  | X    | S    | NH2OH Chk         |                 | 25               | 25                   | 25                   |                   |       |
| 58  | Y    | S    | NH2OH Chk         |                 | 25               | 25                   | 25                   |                   |       |
| 59  | X    | MBA  | MB-3              |                 | 125              | 125                  | 25                   |                   |       |
| 60  | Y    | OPR  | OPR/VER-3         |                 | 25               | 25                   | 25                   | 5.0               |       |
| 61  | X    | OPR  | OPR-1             |                 | 400              | 40                   | 5.0                  | 5.0               |       |
| 62  | Y    | MBA  | MB-1              |                 | 400              | 40                   | 5.0                  |                   |       |
| 63  | X    | MBA  | MB-2              |                 | 400              | 40                   | 5.0                  |                   |       |
| 64  | Y    | QCS  | QCS-1             |                 | 400              | 40                   | 5.0                  | 5.0               |       |
| 65  | X    | QCS  | SRM 2702          |                 | 204              | 40                   | 1.0                  | 447               |       |
| 66  | Y    | S    | K1807551-002      |                 | 440              | 40                   | 5.0                  |                   |       |

## Run Information Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 8/29/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID      | Method<br>Blank | Sample<br>Vol/Wt | Dilution<br>Vol (ml) | Analyzed<br>Vol (ml) | Expected<br>Value | Notes |
|-----|------|------|--------------|-----------------|------------------|----------------------|----------------------|-------------------|-------|
| 67  | X    | MS   | K1807551-002 |                 | 437              | 40                   | 5.0                  | 91.5              |       |
| 68  | Y    | MSD  | K1807551-002 |                 | 445              | 40                   | 5.0                  | 89.9              |       |
| 69  | X    | S    | K1807551-001 |                 | 457              | 40                   | 5.0                  |                   |       |
| 70  | Y    | S    | K1807551-003 |                 | 490              | 40                   | 5.0                  |                   |       |
| 71  | X    | S    | K1807985-003 |                 | 175              | 40                   | 1.0                  |                   |       |
| 72  | X    | MBA  | MB-3         |                 | 400              | 40                   | 5.0                  |                   |       |
| 73  | Y    | OPR  | OPR-2        |                 | 400              | 40                   | 5.0                  | 5.0               |       |
| 74  | X    | OPR  | VER-4        |                 | 25               | 25                   | 25                   | 5.0               |       |

## Metals Digestion Sheet

Service Requests:

Method : 1631E

Analysis for : CVAFS

| Sample         | StarLims # | Date Prepped | > BrCl | Prepared Initial Vol. (ml) | Prepared Final Vol. (ml) | Analyzed Vol. (ml) | Analyzed Dil. Vol. (ml) | Matrix    |
|----------------|------------|--------------|--------|----------------------------|--------------------------|--------------------|-------------------------|-----------|
| Method Blank   |            | 8/28/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| Method Blank   |            | 8/28/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| OPR            |            |              | X      | 25                         | 25                       | 25                 | 25                      | 0.5% BrCl |
| QCS            |            | 8/28/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1808171-001   | 320831     | 8/28/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1808171-001S  | 320831     | 8/28/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1808171-001SD | 320831     | 8/28/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1808153-003   | 320831     | 8/28/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1808153-004   | 320831     | 8/28/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1808153-005   | 320831     | 8/28/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1808153-006   | 320831     | 8/28/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-017 ✓ | 320831     | 8/28/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-018 ✓ | 320831     | 8/28/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-019 ✓ | 320831     | 8/28/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| Method Blank   |            | 8/28/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| OPR            |            |              | X      | 25                         | 25                       | 25                 | 25                      | 0.5% BrCl |

AF2-35-K BrCl

Oxidation Start Time: 3:34pm 8/28/18

AF2-38-D (2.5 ng/mL) -----

QCS: 0.25mL

Digestion Completed: 3:34am 8/29/18

AF2-38-J (100 ng/L) -----

OPR: 1.25mL

1st MS / DMS: 0.125mL AF2-38-H 10ng/mL

2nd MS / DMS: 0.125mL AF2-38-H 10ng/mL

Comments:

Analyst

Anna Boyer

1631Dig.XLS

2/8/2008

**ALS Group USA, Corp.**  
**dba ALS Environmental**  
**Analytical Report**

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** 08/03/18  
**Date Received:** 08/24/18

Mercury, Total

**Prep Method:** METHOD  
**Analysis Method:** 1631E  
**Test Notes:**

**Units:** ng/L  
**Basis:** NA

| Sample Name                             | Lab Code     | MRL | MDL  | Dilution<br>Factor | Date<br>Extracted | Date<br>Analyzed | Result | Result<br>Notes |
|-----------------------------------------|--------------|-----|------|--------------------|-------------------|------------------|--------|-----------------|
| Rinsate Blank-Northern Pike 8/03        | K1807597-020 | 0.5 | 0.06 | 1                  | 10/02/18          | 10/03/18         | 0.46 ✓ | J               |
| Homogenization Blank-Northern Pike 8/03 | K1807597-021 | 0.5 | 0.06 | 1                  | 10/02/18          | 10/03/18         | 0.25 ✓ | J               |
| Homogenization Blank-Northern Pike 8/03 | K1807597-022 | 0.5 | 0.06 | 1                  | 10/02/18          | 10/03/18         | 0.45 ✓ | J               |
| Method Blank                            | K1807597-MB1 | 0.5 | 0.06 | 1                  | 10/02/18          | 10/03/18         | 0.15 ✓ | J               |
| Method Blank                            | K1807597-MB2 | 0.5 | 0.06 | 1                  | 10/02/18          | 10/03/18         | 0.24 ✓ | J               |
| Method Blank                            | K1807597-MB3 | 0.5 | 0.06 | 1                  | 10/02/18          | 10/03/18         | 0.07 ✓ | J               |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 10/02/18  
**Date Analyzed:** 10/03/18

Matrix Spike/Duplicate Matrix Spike Summary  
Total Metals

Sample Name: Batch QC  
Lab Code: K1809498-001MS, K1809498-001DMS  
Test Notes:

Units: ng/L  
Basis: NA

| Analyte | Prep Method | Analysis Method | MRL | Spike Level |    | Sample Result | Spike Result |      | Percent Recovery |     |                       | Relative Percent Difference | Result Notes |
|---------|-------------|-----------------|-----|-------------|----|---------------|--------------|------|------------------|-----|-----------------------|-----------------------------|--------------|
|         |             |                 |     |             |    |               |              |      | MS               | DMS | ALS Acceptance Limits |                             |              |
|         |             |                 |     |             |    |               |              |      |                  |     |                       |                             |              |
| Mercury | METHOD      | 1631E           | 0.5 | 50          | 50 | 1.97          | 39.3         | 42.5 | 75               | 81  | 71-125                | 8                           |              |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 10/03/18

Ongoing Precision and Recovery (OPR) Sample Summary  
Total Metals

Sample Name: Ongoing Precision and Recovery (Initial)

Units: ng/L  
Basis: NA

Test Notes:

| Analyte | Prep Method | Analysis Method | True Value | Result | Percent Recovery | ALS                                | Result Notes |
|---------|-------------|-----------------|------------|--------|------------------|------------------------------------|--------------|
|         |             |                 |            |        |                  | Percent Recovery Acceptance Limits |              |
| Mercury | METHOD      | 1631E           | 5.00       | 4.91 ✓ | 98 ✓             | 77-123                             |              |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 10/03/18

Ongoing Precision and Recovery (OPR) Sample Summary  
Total Metals

**Sample Name:** Ongoing Precision and Recovery (Final)

**Units:** ng/L  
**Basis:** NA

**Test Notes:**

| Analyte | Prep Method | Analysis Method | True Value | Result | Percent Recovery | ALS Percent Recovery Acceptance Limits | Result Notes |
|---------|-------------|-----------------|------------|--------|------------------|----------------------------------------|--------------|
| Mercury | METHOD      | 1631E           | 5.00       | 5.15 ✓ | 103 ✓            | 77-123                                 |              |



ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** 10/02/18  
**Date Analyzed:** 10/03/18

Quality Control Sample (QCS) Summary  
Total Metals

Sample Name: Quality Control Sample

Units: ng/L  
Basis: NA

Test Notes:

| Analyte | Prep Method | Analysis Method | True Value | Result | Percent Recovery | ALS                                | Result Notes |
|---------|-------------|-----------------|------------|--------|------------------|------------------------------------|--------------|
|         |             |                 |            |        |                  | Percent Recovery Acceptance Limits |              |
| Mercury | METHOD      | 1631E           | 5.00       | 4.85 ✓ | 97 ✓             | 77-123                             |              |

## QA Summary Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 10/3/18 ✓

Analyst Name: Anna Boyer

| Calibration        |          |                 |       |             |            |             |        |           |        |
|--------------------|----------|-----------------|-------|-------------|------------|-------------|--------|-----------|--------|
| QA Sample Type     | Name/ID  | Analyzed Result | Units | Spike Level | % REC<br>✓ | % REC Limit | RSD    | RSD Limit | Notes  |
| Calibration        | 12.5 pg  | 12.4            | pg    | 12.5        | 99.4       | 75-125      |        |           | accept |
|                    | 25 pg    | 26.1            | pg    | 25          | 104        | 75-125      |        |           | accept |
|                    | 100 pg   | 96.9            | pg    | 100         | 96.9       | 75-125      |        |           | accept |
|                    | 500 pg   | 525             | pg    | 500         | 105        | 75-125      |        |           | accept |
|                    | 2500 pg  | 2,420           | pg    | 2500        | 96.9       | 75-125      |        |           | accept |
|                    | 10000 pg | 9,820           | pg    | 10000       | 98.2       | 75-125      |        |           | accept |
| Calibration Factor |          | 0.000101 ✓      | pg/PA |             |            |             | 3.57 ✓ | < 15      | accept |
| Calibration Date   |          | 10/3/18         |       |             |            |             |        |           |        |

# QA Summary Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 10/3/18

Analyst Name: Anna Boyer

| Blank Summary  |          |                 |       |          |        |             |        |
|----------------|----------|-----------------|-------|----------|--------|-------------|--------|
| QA Sample Type | Name/ID  | Analyzed Result | Units | Criteria | StDev  | StDev Limit | Notes  |
| CB             | CB-1     | 3.13            | pg    | < 50     |        |             | accept |
|                | CB-2     | 3.41            | pg    | < 50     |        |             | accept |
|                | CB-3     | 2.71            | pg    | < 50     |        |             | accept |
|                | CB-4     | 3.57            | pg    | < 50     |        |             | accept |
| Average        | PA 3.830 | 3.21            | pg    | < 25     | 0.374  | < 10        | accept |
| MBA            | MB-1     | 0.150 ✓         | ng/L  | < 0.5    |        |             | accept |
|                | MB-2     | 0.237 ✓         | ng/L  | < 0.5    |        |             | accept |
|                | MB-3     | 0.0710 ✓        | ng/L  | < 0.5    |        |             | accept |
|                | MB-1     | 0.0896          | ng/L  | < 0.5    |        |             | accept |
|                | MB-2     | 0.176           | ng/L  | < 0.5    |        |             | accept |
|                | MB-3     | 0.0336          | ng/L  | < 0.5    |        |             | accept |
|                | MB-1     | 0.0731          | ng/L  | < 0.5    |        |             | accept |
|                | MB-2     | 0.0152          | ng/L  | < 0.5    |        |             | accept |
|                | MB-3     | 0.0557          | ng/L  | < 0.5    |        |             | accept |
| Average        |          | 0.100           | ng/L  |          | 0.0727 |             |        |

QA Comments:

# QA Summary Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 10/3/18

Analyst Name: Anna Boyer

| Bias and Precision |                         |                 |                 |                 |                   |                 |                   |                 |                    |                     |
|--------------------|-------------------------|-----------------|-----------------|-----------------|-------------------|-----------------|-------------------|-----------------|--------------------|---------------------|
| Type               | Name/ID                 | Final Result    | Units           | Spike Level     | Source Result     | % REC           | % REC Limit       | RPD             | RPD Limit          | Notes               |
| MS                 | K1809498-001            | 39.3            | ng/L            | 50.0            | 1.97              | 74.6            | 71-125            |                 |                    | accept              |
|                    | K1809366-001            | 51.2            | ng/L            | 50.0            | 0.793             | 101             | 71-125            |                 |                    | accept              |
|                    | <del>K1809496-001</del> | <del>4.19</del> | <del>ng/L</del> | <del>50.0</del> | <del>0.0902</del> | <del>8.19</del> | <del>71-125</del> |                 |                    | <del>reject</del> * |
|                    | K1809496-001            | 197             | ng/L            | 250             | 0.0902            | 78.6            | 71-125            |                 |                    | accept              |
|                    | K1809457-004            | 47.0            | ng/L            | 50.0            | 0.547             | 92.9            | 71-125            |                 |                    | accept              |
|                    | K1809548-001            | 46.2            | ng/L            | 50.0            | 0.573             | 91.3            | 71-125            |                 |                    | accept              |
| MSD                | K1809498-001            | 42.5            | ng/L            | 50.0            | 1.97              | 81.1            | 71-125            | 8.00            | < 24               | accept              |
|                    | K1809366-001            | 47.9            | ng/L            | 50.0            | 0.793             | 94.2            | 71-125            | 6.78            | < 24               | accept              |
|                    | <del>K1809496-001</del> | <del>3.75</del> | <del>ng/L</del> | <del>50.0</del> | <del>0.0902</del> | <del>7.31</del> | <del>71-125</del> | <del>4.00</del> | <del>&lt; 24</del> | <del>reject</del> * |
|                    | K1809496-001            | 205             | ng/L            | 250             | 0.0902            | 81.8            | 71-125            | 4.00            | < 24               | accept              |
|                    | K1809457-004            | 45.2            | ng/L            | 50.0            | 0.547             | 89.3            | 71-125            | 3.89            | < 24               | accept              |
|                    | K1809548-001            | 43.0            | ng/L            | 50.0            | 0.573             | 84.8            | 71-125            | 7.24            | < 24               | accept              |
| OPR                | OPR-1                   | 4.91 ✓          | ng/L            | 5               |                   | 98.3            | 77-123            |                 |                    | accept              |
|                    | OPR-2                   | 5.15 ✓          | ng/L            | 5.0             |                   | 103             | 77-123            |                 |                    | accept              |
|                    | OPR-3                   | 5.02            | ng/L            | 5.0             |                   | 100.            | 77-123            |                 |                    | accept              |
|                    | OPR-4                   | 4.72            | ng/L            | 5.0             |                   | 94.4            | 77-123            |                 |                    | accept              |
|                    | <del>OPR-5</del>        | <del>5.01</del> | <del>ng/L</del> | <del>5.0</del>  |                   | <del>100.</del> | <del>77-123</del> |                 |                    | <del>reject</del> * |
| QCS                | QCS-1                   | 4.85 ✓          | ng/L            | 5               |                   | 97.1            | 77-123            |                 |                    | accept              |
|                    | QCS-1                   | 4.14 ✓          | ng/L            | 5.0             |                   | 82.8            | 77-123            |                 |                    | accept              |
|                    | QCS-1                   | 4.14            | ng/L            | 5.0             |                   | 82.9            | 77-123            |                 |                    | accept              |

\*AB  
10/4/18

# Run Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 10/3/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID        | Method<br>Blank | Peak | Peak Area    | Analyzed Result<br>(pg) | Final Result<br>(ng/L) | QA Results | Criteria | Notes    |
|-----|------|------|----------------|-----------------|------|--------------|-------------------------|------------------------|------------|----------|----------|
| 1   | X    | CCB  | RINSE          |                 | 1    | 47,008       | 1.53                    |                        | 1.53       | < 50     | accept   |
| 2   | Y    | CCB  | RINSE          |                 | 1    | 36,294       | 0.450                   |                        | 0.450      | < 50     | accept   |
| 3   | X    | CB   | CB-1           |                 | 1    | 31,114 ✓     | 3.13                    |                        | 3.13       | < 50     | accept   |
| 4   | Y    | CB   | CB-2           |                 | 1    | 33,859 ✓     | 3.41                    |                        | 3.41       | < 50     | accept   |
| 5   | X    | CB   | CB-3           |                 | 1    | 26,942 ✓     | 2.71                    |                        | 2.71       | < 50     | accept   |
| 6   | Y    | CB   | CB-4           |                 | 1    | 35,403 ✓     | 3.57                    |                        | 3.57       | < 50     | accept   |
| 7   | X    | STD  | 12.5 pg        |                 | 2    | 155,118 ✓    | 12.4                    |                        | 99.4       | 75-125   | accept   |
| 8   | Y    | STD  | 25 pg          |                 | 1    | 290,640 ✓    | 26.1                    |                        | 104        | 75-125   | accept   |
| 9   | X    | STD  | 100 pg         |                 | 1    | 993,577 ✓    | 96.9                    |                        | 96.9       | 75-125   | accept   |
| 10  | Y    | STD  | 500 pg         |                 | 1    | 5,240,646 ✓  | 525                     |                        | 105        | 75-125   | accept   |
| 11  | X    | STD  | 2500 pg        |                 | 1    | 24,079,015 ✓ | 2,420                   |                        | 96.9       | 75-125   | accept   |
| 12  | Y    | STD  | 10000 pg       |                 | 1    | 97,463,360 ✓ | 9,820                   |                        | 98.2       | 75-125   | accept   |
| 13  | X    | OPR  | OPR-1          |                 | 1    | 1,251,227 ✓  | 123 ✓                   | 4.91 ✓                 | 98.3       | 77-123   | accept   |
| 14  | Y    | QCS  | QCS-1          |                 | 1    | 1,236,262 ✓  | 121 ✓                   | 4.85 ✓                 | 97.1       | 77-123   | accept   |
| 15  | X    | MBA  | MB-1           |                 | 1    | 68,930 ✓     | 3.74 ✓                  | 0.150 ✓                | 0.150      | < 0.5    | accept   |
| 16  | Y    | S    | K1809498-001   |                 | 1    | 521,111      | 49.3                    | 1.97                   |            | < HS     | accept   |
| 17  | X    | MS   | K1809498-001   |                 | 1    | 9,774,361    | 982                     | 39.3                   | 74.6       | 71-125   | accept   |
| 18  | Y    | MSD  | K1809498-001   |                 | 1    | 10,586,653   | 1,060                   | 42.5                   | 81.1       | 71-125   | accept   |
| 19  | X    | S    | K1808854-014   |                 | 1    | 142,510      | 11.2                    | 0.446                  |            | < HS     | accept   |
| 20  | Y    | S    | K1808854-017   |                 | 1    | 168,750      | 13.8                    | 0.552                  |            | < HS     | reject * |
| 21  | X    | S    | K1807597-020 ✓ |                 | 1    | 144,744 ✓    | 11.4 ✓                  | 0.455 ✓                |            | < HS     | accept   |
| 22  | Y    | S    | K1807597-021   |                 | 1    | 162,089      | 13.1                    | 0.525                  |            | < HS     | reject * |
| 23  | X    | S    | K1807597-022 ✓ |                 | 1    | 142,575 ✓    | 11.2 ✓                  | 0.446 ✓                |            | < HS     | accept   |
| 24  | Y    | S    | K1809464-001   |                 | 1    | 108,686      | 7.74                    | 0.310                  |            | < HS     | accept   |
| 25  | X    | S    | K1809464-002   |                 | 1    | 120,159      | 8.90                    | 0.356                  |            | < HS     | accept   |
| 26  | Y    | S    | K1808854-017   |                 | 1    | 116,278      | 8.51                    | 0.340                  |            | < HS     | accept   |
| 27  | X    | S    | K1807597-021 ✓ |                 | 1    | 94,013 ✓     | 6.27 ✓                  | 0.251 ✓                |            | < HS     | accept   |
| 28  | Y    | S    | K1809466-001   |                 | 1    | 133,373      | 10.2                    | 0.409                  |            | < HS     | accept   |
| 29  | X    | S    | K1809466-002   |                 | 1    | 1,029,441    | 101                     | 4.02                   |            | < HS     | accept   |
| 30  | Y    | MBA  | MB-2           |                 | 1    | 90,671 ✓     | 5.93 ✓                  | 0.237 ✓                | 0.237      | < 0.5    | accept   |
| 31  | X    | S    | K1809366-001   |                 | 1    | 228,640      | 19.8                    | 0.793                  |            | < HS     | accept   |
| 32  | Y    | MS   | K1809366-001   |                 | 1    | 12,745,830   | 1,280                   | 51.2                   | 101        | 71-125   | accept   |
| 33  | X    | MSD  | K1809366-001   |                 | 1    | 11,912,035   | 1,200                   | 47.9                   | 94.2       | 71-125   | accept   |

\* See  
re-run  
AB  
10/4/18

# Run Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 10/3/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID                 | Method<br>Blank | Peak | Peak Area            | Analyzed Result<br>(pg) | Final Result<br>(ng/L) | QA Results      | Criteria | Notes  |
|-----|------|------|-------------------------|-----------------|------|----------------------|-------------------------|------------------------|-----------------|----------|--------|
| 34  | Y    | S    | K1809366-002            |                 | 1    | 165,288              | 13.4                    | 0.538                  |                 | < HS     | accept |
| 35  | X    | S    | K1809366-003            |                 | 1    | 202,580              | 17.2                    | 0.688                  |                 | < HS     | accept |
| 36  | Y    | S    | K1809366-004            |                 | 1    | 162,268              | 13.1                    | 0.526                  |                 | < HS     | accept |
| 37  | X    | S    | K1809504-001            |                 | 1    | 2,584,841            | 257                     | 10.3                   |                 | < HS     | accept |
| 38  | Y    | S    | K1809504-002            |                 | 1    | 724,617              | 69.8                    | 2.79                   |                 | < HS     | accept |
| 39  | X    | S    | K1809412-001            |                 | 1    | 260,905              | 23.1                    | 0.923                  |                 | < HS     | accept |
| 40  | Y    | S    | K1809412-002            |                 | 1    | 299,737              | 27.0                    | 1.08                   |                 | < HS     | accept |
| 41  | X    | S    | K1809417-001            |                 | 1    | 148,112              | 11.7                    | 0.469                  |                 | < HS     | accept |
| 42  | Y    | S    | K1809417-002            |                 | 1    | 89,580               | 5.82                    | 0.233                  |                 | < HS     | accept |
| 43  | X    | MBA  | MB-3                    |                 | 1    | 49,434 ✓             | 1.77 ✓                  | 0.0710 ✓               | 0.0710          | < 0.5    | accept |
| 44  | Y    | OPR  | OPR-2                   |                 | 1    | 1,309,163 ✓          | 129 ✓                   | 5.15 ✓                 | 103             | 77-123   | accept |
| 45  | X    | QCS  | QCS-1                   |                 | 1    | 1,059,124 ✓          | 104 ✓                   | 4.14 ✓                 | 82.8            | 77-123   | accept |
| 46  | Y    | MBA  | MB-1                    |                 | 1    | 54,058               | 2.24                    | 0.0896                 | 0.0896          | < 0.5    | accept |
| 47  | X    | S    | <del>K1809496-001</del> |                 | 1    | <del>54,200</del>    | <del>2.25</del>         | <del>0.0902</del>      |                 | < HS     | accept |
| 48  | Y    | MS   | <del>K1809496-001</del> |                 | 1    | <del>1,070,416</del> | <del>105</del>          | <del>4.19</del>        | <del>8.19</del> | 71-125   | reject |
| 49  | X    | MSD  | <del>K1809496-001</del> |                 | 1    | <del>961,592</del>   | <del>93.7</del>         | <del>3.75</del>        | <del>7.31</del> | 71-125   | reject |
| 50  | Y    | S    | K1809494-001            |                 | 1    | 77,087               | 4.56                    | 0.182                  |                 | < HS     | accept |
| 51  | X    | S    | K1809492-001            |                 | 1    | 232,048              | 20.2                    | 0.807                  |                 | < HS     | accept |
| 52  | Y    | S    | K1809497-001            |                 | 1    | 813,726              | 78.8                    | 3.15                   |                 | < HS     | accept |
| 53  | X    | S    | K1809497-002            |                 | 1    | 633,039              | 60.6                    | 2.42                   |                 | < HS     | accept |
| 54  | Y    | S    | K1809497-003            |                 | 2    | 842,140              | 81.6                    | 3.27                   |                 | < HS     | accept |
| 55  | X    | S    | K1809497-004            |                 | 1    | 778,482              | 75.2                    | 3.01                   |                 | < HS     | accept |
| 56  | Y    | S    | K1809496-001            |                 | 1    | 185,132              | 15.4                    | 3.09                   |                 | < HS     | accept |
| 57  | X    | MS   | K1809496-001            |                 | 1    | 9,789,044            | 983                     | 197                    | 78.6            | 71-125   | accept |
| 58  | Y    | MSD  | K1809496-001            |                 | 1    | 10,186,885           | 1,020                   | 205                    | 81.8            | 71-125   | accept |
| 59  | X    | S    | K1809457-001            |                 | 1    | 173,410              | 14.3                    | 0.571                  |                 | < HS     | accept |
| 60  | Y    | S    | K1809457-002            |                 | 1    | 110,473              | 7.92                    | 0.317                  |                 | < HS     | accept |
| 61  | X    | S    | K1809457-003            |                 | 1    | 129,987              | 9.89                    | 0.396                  |                 | < HS     | accept |
| 62  | Y    | MBA  | MB-2                    |                 | 1    | 75,393               | 4.39                    | 0.176                  | 0.176           | < 0.5    | accept |
| 63  | X    | S    | K1809457-004            |                 | 1    | 167,581              | 13.7                    | 0.547                  |                 | < HS     | accept |
| 64  | Y    | MS   | K1809457-004            |                 | 1    | 11,689,416           | 1,170                   | 47.0                   | 92.9            | 71-125   | accept |
| 65  | X    | MSD  | K1809457-004            |                 | 1    | 11,245,083           | 1,130                   | 45.2                   | 89.3            | 71-125   | accept |
| 66  | Y    | S    | K1809457-005            |                 | 1    | 302,615              | 27.3                    | 1.09                   |                 | < HS     | accept |

See  
dilution  
AB  
10/4/18

# Run Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 10/3/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID           | Method<br>Blank | Peak | Peak Area  | Analyzed Result<br>(pg) | Final Result<br>(ng/L) | QA Results | Criteria | Notes  |
|-----|------|------|-------------------|-----------------|------|------------|-------------------------|------------------------|------------|----------|--------|
| 67  | X    | S    | K1809457-006      |                 | 1    | 93,102     | 6.17                    | 0.247                  |            | < HS     | accept |
| 68  | Y    | S    | K1809457-007      |                 | 1    | 1,342,274  | 132                     | 5.28                   |            | < HS     | accept |
| 69  | X    | S    | K1809457-008      |                 | 1    | 95,024     | 6.37                    | 0.255                  |            | < HS     | accept |
| 70  | Y    | S    | K1809457-009      |                 | 1    | 153,466    | 12.3                    | 0.490                  |            | < HS     | accept |
| 71  | X    | S    | K1809457-010      |                 | 1    | 245,225    | 21.5                    | 0.860                  |            | < HS     | accept |
| 72  | Y    | S    | K1809457-011      |                 | 1    | 212,585    | 18.2                    | 0.729                  |            | < HS     | accept |
| 73  | X    | S    | K1809457-012      |                 | 1    | 341,807    | 31.2                    | 1.25                   |            | < HS     | accept |
| 74  | Y    | S    | K1809457-013      |                 | 1    | 95,967     | 6.46                    | 0.258                  |            | < HS     | accept |
| 75  | X    | MBA  | MB-3              |                 | 1    | 40,156     | 0.839                   | 0.0336                 | 0.0336     | < 0.5    | accept |
| 76  | Y    | OPR  | OPR-3             |                 | 1    | 1,278,147  | 126                     | 5.02                   | 100.       | 77-123   | accept |
| 77  | X    | QCS  | QCS-1             |                 | 1    | 1,060,233  | 104                     | 4.14                   | 82.9       | 77-123   | accept |
| 78  | Y    | MBA  | MB-1              |                 | 1    | 49,964     | 1.83                    | 0.0731                 | 0.0731     | < 0.5    | accept |
| 79  | X    | S    | K1809548-001      |                 | 1    | 173,965    | 14.3                    | 0.573                  |            | < HS     | accept |
| 80  | Y    | MS   | K1809548-001      |                 | 1    | 11,497,060 | 1,160                   | 46.2                   | 91.3       | 71-125   | accept |
| 81  | X    | MSD  | K1809548-001      |                 | 1    | 10,695,898 | 1,070                   | 43.0                   | 84.8       | 71-125   | accept |
| 82  | Y    | S    | K1809548-003      |                 | 1    | 331,850    | 30.2                    | 1.21                   |            | < HS     | accept |
| 83  | X    | S    | K1809490-001      |                 | 1    | 701,662    | 67.5                    | 2.70                   |            | < HS     | accept |
| 84  | Y    | S    | K1809488-001      |                 | 1    | 1,057,018  | 103                     | 4.13                   |            | < HS     | accept |
| 85  | X    | S    | K1809487-001      |                 | 1    | 163,260    | 13.2                    | 0.530                  |            | < HS     | accept |
| 86  | Y    | S    | K1809549-001      |                 | 1    | 129,295    | 9.82                    | 0.393                  |            | < HS     | accept |
| 87  | X    | S    | K1809549-004      |                 | 1    | 1,136,343  | 111                     | 4.45                   |            | < HS     | accept |
| 88  | Y    | S    | K1809549-005 DISS |                 | 1    | 259,646    | 23.0                    | 0.918                  |            | < HS     | accept |
| 89  | X    | MBA  | MB-2              |                 | 3    | 35,607     | 0.381                   | 0.0152                 | 0.0152     | < 0.5    | accept |
| 90  | Y    | MBA  | MB-3              |                 | 1    | 45,659     | 1.39                    | 0.0557                 | 0.0557     | < 0.5    | accept |
| 91  | X    | OPR  | OPR-4             |                 | 1    | 1,202,487  | 118                     | 4.72                   | 94.4       | 77-123   | accept |
| 92  | Y    | S    | K1809548-003      |                 | 1    | 434,593    | 40.6                    | 1.62                   |            | < HS     | reject |
| 93  | X    | S    | K1809549-004      |                 | 1    | 1,266,515  | 123                     | 4.94                   |            | < HS     | reject |
| 94  | Y    | OPR  | OPR-5             |                 | 1    | 1,275,736  | 125                     | 5.01                   | 100.       | 77-123   | reject |

Review  
to  
confirm  
AB  
10/4/18

# Run Information Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 10/3/18

Analyst Name: Anna Boyer

| Run | Trap | Type | Name/ID                 | Method Blank | Sample Vol/Wt  | Dilution Vol (ml) | Analyzed Vol (ml) | Expected Value | Notes |
|-----|------|------|-------------------------|--------------|----------------|-------------------|-------------------|----------------|-------|
| 1   | X    | CCB  | RINSE                   |              |                |                   |                   |                |       |
| 2   | Y    | CCB  | RINSE                   |              |                |                   |                   |                |       |
| 3   | X    | CB   | CB-1                    |              |                |                   |                   |                |       |
| 4   | Y    | CB   | CB-2                    |              |                |                   |                   |                |       |
| 5   | X    | CB   | CB-3                    |              |                |                   |                   |                |       |
| 6   | Y    | CB   | CB-4                    |              |                |                   |                   |                |       |
| 7   | X    | STD  | 12.5 pg                 |              |                |                   |                   | 12.5           |       |
| 8   | Y    | STD  | 25 pg                   |              |                |                   |                   | 25             |       |
| 9   | X    | STD  | 100 pg                  |              |                |                   |                   | 100            |       |
| 10  | Y    | STD  | 500 pg                  |              |                |                   |                   | 500            |       |
| 11  | X    | STD  | 2500 pg                 |              |                |                   |                   | 2500           |       |
| 12  | Y    | STD  | 10000 pg                |              |                |                   |                   | 10000          |       |
| 13  | X    | OPR  | OPR-1                   |              | 25             | 25                | 25                | 5              |       |
| 14  | Y    | QCS  | QCS-1                   |              | 125            | 125               | 25                | 5              |       |
| 15  | X    | MBA  | MB-1                    |              | 125            | 125               | 25                |                |       |
| 16  | Y    | S    | K1809498-001            |              | 125            | 125               | 25                |                |       |
| 17  | X    | MS   | K1809498-001            |              | 125            | 125               | 25                | 50.0           |       |
| 18  | Y    | MSD  | K1809498-001            |              | 125            | 125               | 25                | 50.0           |       |
| 19  | X    | S    | K1808854-014            |              | 125            | 125               | 25                |                |       |
| 20  | Y    | S    | <del>K1808854-017</del> |              | <del>125</del> | <del>125</del>    | <del>25</del>     |                |       |
| 21  | X    | S    | K1807597-020 ✓          |              | 125            | 125               | 25                |                |       |
| 22  | Y    | S    | <del>K1807597-021</del> |              | <del>125</del> | <del>125</del>    | <del>25</del>     |                |       |
| 23  | X    | S    | K1807597-022 ✓          |              | 125            | 125               | 25                |                |       |
| 24  | Y    | S    | K1809464-001            |              | 250            | 250               | 25                |                |       |
| 25  | X    | S    | K1809464-002            |              | 250            | 250               | 25                |                |       |
| 26  | Y    | S    | K1808854-017            |              | 125            | 125               | 25                |                |       |
| 27  | X    | S    | K1807597-021 ✓          |              | 125            | 125               | 25                |                |       |
| 28  | Y    | S    | K1809466-001            |              | 250            | 250               | 25                |                |       |
| 29  | X    | S    | K1809466-002            |              | 250            | 250               | 25                |                |       |
| 30  | Y    | MBA  | MB-2                    |              | 125            | 125               | 25                |                |       |
| 31  | X    | S    | K1809366-001            |              | 125            | 125               | 25                |                |       |
| 32  | Y    | MS   | K1809366-001            |              | 125            | 125               | 25                | 50.0           |       |
| 33  | X    | MSD  | K1809366-001            |              | 125            | 125               | 25                | 50.0           |       |

AB  
10/4/18



# Run Information Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 10/3/18

Analyst Name: Anna Boyer

| Run | Trap         | Type           | Name/ID                 | Method<br>Blank | Sample<br>Vol/Wt | Dilution<br>Vol (ml) | Analyzed<br>Vol (ml) | Expected<br>Value | Notes |
|-----|--------------|----------------|-------------------------|-----------------|------------------|----------------------|----------------------|-------------------|-------|
| 34  | Y            | S              | K1809366-002            |                 | 125              | 125                  | 25                   |                   |       |
| 35  | X            | S              | K1809366-003            |                 | 125              | 125                  | 25                   |                   |       |
| 36  | Y            | S              | K1809366-004            |                 | 125              | 125                  | 25                   |                   |       |
| 37  | X            | S              | K1809504-001            |                 | 125              | 125                  | 25                   |                   |       |
| 38  | Y            | S              | K1809504-002            |                 | 125              | 125                  | 25                   |                   |       |
| 39  | X            | S              | K1809412-001            |                 | 125              | 125                  | 25                   |                   |       |
| 40  | Y            | S              | K1809412-002            |                 | 125              | 125                  | 25                   |                   |       |
| 41  | X            | S              | K1809417-001            |                 | 125              | 125                  | 25                   |                   |       |
| 42  | Y            | S              | K1809417-002            |                 | 125              | 125                  | 25                   |                   |       |
| 43  | X            | MBA            | MB-3                    |                 | 125              | 125                  | 25                   |                   |       |
| 44  | Y            | OPR            | OPR-2                   |                 | 25               | 25                   | 25                   | 5.0               |       |
| 45  | X            | QCS            | QCS-1                   |                 | 125              | 125                  | 25                   | 5.0               |       |
| 46  | Y            | MBA            | MB-1                    |                 | 125              | 125                  | 25                   |                   |       |
| 47  | <del>X</del> | <del>S</del>   | <del>K1809496-001</del> |                 | <del>125</del>   | <del>125</del>       | <del>25</del>        |                   |       |
| 48  | <del>Y</del> | <del>MS</del>  | <del>K1809496-001</del> |                 | <del>125</del>   | <del>125</del>       | <del>25</del>        | 50.0              |       |
| 49  | <del>X</del> | <del>MSD</del> | <del>K1809496-001</del> |                 | <del>125</del>   | <del>125</del>       | <del>25</del>        | 50.0              |       |
| 50  | Y            | S              | K1809494-001            |                 | 125              | 125                  | 25                   |                   |       |
| 51  | X            | S              | K1809492-001            |                 | 125              | 125                  | 25                   |                   |       |
| 52  | Y            | S              | K1809497-001            |                 | 125              | 125                  | 25                   |                   |       |
| 53  | X            | S              | K1809497-002            |                 | 125              | 125                  | 25                   |                   |       |
| 54  | Y            | S              | K1809497-003            |                 | 125              | 125                  | 25                   |                   |       |
| 55  | X            | S              | K1809497-004            |                 | 125              | 125                  | 25                   |                   |       |
| 56  | Y            | S              | K1809496-001            |                 | 125              | 125                  | 5.0                  |                   | 1/5   |
| 57  | X            | MS             | K1809496-001            |                 | 125              | 125                  | 5.0                  | 250               | 1/5   |
| 58  | Y            | MSD            | K1809496-001            |                 | 125              | 125                  | 5.0                  | 250               | 1/5   |
| 59  | X            | S              | K1809457-001            |                 | 125              | 125                  | 25                   |                   |       |
| 60  | Y            | S              | K1809457-002            |                 | 125              | 125                  | 25                   |                   |       |
| 61  | X            | S              | K1809457-003            |                 | 125              | 125                  | 25                   |                   |       |
| 62  | Y            | MBA            | MB-2                    |                 | 125              | 125                  | 25                   |                   |       |
| 63  | X            | S              | K1809457-004            |                 | 125              | 125                  | 25                   |                   |       |
| 64  | Y            | MS             | K1809457-004            |                 | 125              | 125                  | 25                   | 50.0              |       |
| 65  | X            | MSD            | K1809457-004            |                 | 125              | 125                  | 25                   | 50.0              |       |
| 66  | Y            | S              | K1809457-005            |                 | 125              | 125                  | 25                   |                   |       |

AB  
10/4/18

# Run Information Report

Batch Number:

Method Number: EPA 1631E

Project Number(s):

Instrument ID: K-AFS-04

Date Analyzed: 10/3/18

Analyst Name: Anna Boyer

| Run | Trap | Type           | Name/ID                 | Method<br>Blank | Sample<br>Vol/Wt | Dilution<br>Vol (ml) | Analyzed<br>Vol (ml) | Expected<br>Value | Notes |
|-----|------|----------------|-------------------------|-----------------|------------------|----------------------|----------------------|-------------------|-------|
| 67  | X    | S              | K1809457-006            |                 | 125              | 125                  | 25                   |                   |       |
| 68  | Y    | S              | K1809457-007            |                 | 125              | 125                  | 25                   |                   |       |
| 69  | X    | S              | K1809457-008            |                 | 125              | 125                  | 25                   |                   |       |
| 70  | Y    | S              | K1809457-009            |                 | 125              | 125                  | 25                   |                   |       |
| 71  | X    | S              | K1809457-010            |                 | 125              | 125                  | 25                   |                   |       |
| 72  | Y    | S              | K1809457-011            |                 | 125              | 125                  | 25                   |                   |       |
| 73  | X    | S              | K1809457-012            |                 | 125              | 125                  | 25                   |                   |       |
| 74  | Y    | S              | K1809457-013            |                 | 125              | 125                  | 25                   |                   |       |
| 75  | X    | MBA            | MB-3                    |                 | 125              | 125                  | 25                   |                   |       |
| 76  | Y    | OPR            | OPR-3                   |                 | 25               | 25                   | 25                   | 5.0               |       |
| 77  | X    | QCS            | QCS-1                   |                 | 125              | 125                  | 25                   | 5.0               |       |
| 78  | Y    | MBA            | MB-1                    |                 | 125              | 125                  | 25                   |                   |       |
| 79  | X    | S              | K1809548-001            |                 | 125              | 125                  | 25                   |                   |       |
| 80  | Y    | MS             | K1809548-001            |                 | 125              | 125                  | 25                   | 50.0              |       |
| 81  | X    | MSD            | K1809548-001            |                 | 125              | 125                  | 25                   | 50.0              |       |
| 82  | Y    | S              | K1809548-003            |                 | 125              | 125                  | 25                   |                   |       |
| 83  | X    | S              | K1809490-001            |                 | 125              | 125                  | 25                   |                   |       |
| 84  | Y    | S              | K1809488-001            |                 | 125              | 125                  | 25                   |                   |       |
| 85  | X    | S              | K1809487-001            |                 | 125              | 125                  | 25                   |                   |       |
| 86  | Y    | S              | K1809549-001            |                 | 125              | 125                  | 25                   |                   |       |
| 87  | X    | S              | K1809549-004            |                 | 125              | 125                  | 25                   |                   |       |
| 88  | Y    | S              | K1809549-005 DISS       |                 | 125              | 125                  | 25                   |                   |       |
| 89  | X    | MBA            | MB-2                    |                 | 125              | 125                  | 25                   |                   |       |
| 90  | Y    | MBA            | MB-3                    |                 | 125              | 125                  | 25                   |                   |       |
| 91  | X    | OPR            | OPR-4                   |                 | 25               | 25                   | 25                   | 5.0               |       |
| 92  | Y    | <del>S</del>   | <del>K1809548-003</del> |                 | <del>125</del>   | <del>125</del>       | <del>25</del>        |                   |       |
| 93  | X    | <del>S</del>   | <del>K1809549-004</del> |                 | <del>125</del>   | <del>125</del>       | <del>25</del>        |                   |       |
| 94  | Y    | <del>OPR</del> | <del>OPR-5</del>        |                 | <del>25</del>    | <del>25</del>        | <del>25</del>        | <del>5.0</del>    |       |

AB  
10/4/18

## Metals Digestion Sheet

Service Requests:

Method : 1631E

Analysis for : CVAFS

| Sample         | StarLims # | Date Prepped | > BrCl | Prepared Initial Vol. (ml) | Prepared Final Vol. (ml) | Analyzed Vol. (ml) | Analyzed Dil. Vol. (ml) | Matrix    |
|----------------|------------|--------------|--------|----------------------------|--------------------------|--------------------|-------------------------|-----------|
| Method Blank   |            | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| Method Blank   |            | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| OPR            |            |              | X      | 25                         | 25                       | 25                 | 25                      | 0.5% BrCl |
| QCS            |            | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1809498-001   | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1809498-001S  | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1809498-001SD | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1808854-014   | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1808854-017   | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-020 ✓ | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-021 ✓ | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1807597-022 ✓ | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1809464-001   | 323083     | 10/2/2018    | X      | 250                        | 250                      | 25                 | 25                      | 0.5% BrCl |
| K1809464-002   | 323083     | 10/2/2018    | X      | 250                        | 250                      | 25                 | 25                      | 0.5% BrCl |
| K1809466-001   | 323083     | 10/2/2018    | X      | 250                        | 250                      | 25                 | 25                      | 0.5% BrCl |
| K1809466-002   | 323083     | 10/2/2018    | X      | 250                        | 250                      | 25                 | 25                      | 0.5% BrCl |
| K1809366-001   | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1809366-001S  | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1809366-001SD | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1809366-002   | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1809366-003   | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1809366-004   | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1809504-001   | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1809504-002   | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1809412-001   | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1809412-002   | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1809417-001   | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| K1809417-002   | 323083     | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| Method Blank   |            | 10/2/2018    | X      | 125                        | 125                      | 25                 | 25                      | 0.5% BrCl |
| OPR            |            |              | X      | 25                         | 25                       | 25                 | 25                      | 0.5% BrCl |

AF2-38-F BrCl

Oxidation Start Time: 2:42pm 10/2/18 ✓

AF2-40-J (2.5 ng/mL) -----

QCS: 0.25mL

Digestion Completed: 2:42am 10/3/18

AF2-41-E (100 ng/L) -----

OPR: 1.25mL

1st MS / DMS: 0.125mL AF2-41-D 10ng/mL

2nd MS / DMS: 0.125mL AF2-41-D 10ng/mL

Comments:

Analyst

Anna Boyer

1631Dig.XLS  
2/8/2008

**ALS Group USA, Corp.**  
dba ALS Environmental  
Analytical Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** 08/06-24/18  
**Date Received:** 08/10-24/18

Total Inorganic Arsenic

**Prep Method:** None  
**Analysis Method:** 1632A  
**Test Notes:**

**Units:** ug/L  
**Basis:** NA

| Sample Name                             | Lab Code     | MRL  | MDL   | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|-----------------------------------------|--------------|------|-------|-----------------|----------------|---------------|--------|--------------|
| Rinsate Blank-Northern Pike 8/14        | K1807597-002 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Homogenization Blank-Northern Pike 8/14 | K1807597-003 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Homogenization Blank-Northern Pike 8/14 | K1807597-004 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Rinsate Blank-Northern Pike 8/15        | K1807597-005 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Homogenization Blank-Northern Pike 8/15 | K1807597-006 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Homogenization Blank-Northern Pike 8/15 | K1807597-007 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Rinsate Blank-Northern Pike 8/17        | K1807597-008 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Homogenization Blank-Northern Pike 8/17 | K1807597-009 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Homogenization Blank-Northern Pike 8/17 | K1807597-010 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Rinsate Blank-Northern Pike 8/21        | K1807597-011 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Homogenization Blank-Northern Pike 8/21 | K1807597-012 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Homogenization Blank-Northern Pike 8/21 | K1807597-013 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Rinsate Blank-Northern Pike 8/22        | K1807597-014 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Homogenization Blank-Northern Pike 8/22 | K1807597-015 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Homogenization Blank-Northern Pike 8/22 | K1807597-016 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Rinsate Blank-Northern Pike 8/24        | K1807597-017 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Homogenization Blank-Northern Pike 8/24 | K1807597-018 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Homogenization Blank-Northern Pike 8/24 | K1807597-019 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Method Blank 1                          | K1807597-MB1 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Method Blank 2                          | K1807597-MB2 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Method Blank 3                          | K1807597-MB3 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Method Blank 4                          | K1807597-MB4 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Method Blank 5                          | K1807597-MB5 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | ND     |              |
| Method Blank 6                          | K1807597-MB6 | 0.02 | 0.003 | 1               | NA             | 08/27/18      | 0.004  | J            |

no impact

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/27/18

Calibration Verification (CALVER) Sample Summary  
Total Metals

Sample Name: CALVER 1

Units: ug/L  
Basis: NA

Test Notes:

| Analyte           | Prep Method | Analysis Method | True Value | Result  | Percent Recovery | CAS                                | Result Notes |
|-------------------|-------------|-----------------|------------|---------|------------------|------------------------------------|--------------|
|                   |             |                 |            |         |                  | Percent Recovery Acceptance Limits |              |
| Inorganic Arsenic | None        | 1632A           | 0.200      | 0.195 ✓ | 98 ✓             | 80-120                             |              |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/27/18

Calibration Verification (CALVER) Sample Summary  
Total Metals

Sample Name: CALVER 2

Units: ug/L  
Basis: NA

Test Notes:

| Analyte           | Prep Method | Analysis Method | True Value | Result  | Percent Recovery | CAS Percent Recovery Acceptance Limits | Result Notes |
|-------------------|-------------|-----------------|------------|---------|------------------|----------------------------------------|--------------|
| Inorganic Arsenic | None        | 1632A           | 0.200      | 0.171 ✓ | 86 ✓             | 80-120                                 |              |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/27/18

Calibration Verification (CALVER) Sample Summary  
Total Metals

Sample Name: CALVER 3

Units: ug/L  
Basis: NA

Test Notes:

| Analyte           | Prep Method | Analysis Method | True Value | Result  | Percent Recovery | CAS                                | Result Notes |
|-------------------|-------------|-----------------|------------|---------|------------------|------------------------------------|--------------|
|                   |             |                 |            |         |                  | Percent Recovery Acceptance Limits |              |
| Inorganic Arsenic | None        | 1632A           | 0.200      | 0.174 ✓ | 87 ✓             | 80-120                             |              |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/27/18

Calibration Verification (CALVER) Sample Summary  
Total Metals

Sample Name: CALVER 4

Units: ug/L  
Basis: NA

Test Notes:

| Analyte           | Prep Method | Analysis Method | True Value | Result  | Percent Recovery | CAS                                | Result Notes |
|-------------------|-------------|-----------------|------------|---------|------------------|------------------------------------|--------------|
|                   |             |                 |            |         |                  | Percent Recovery Acceptance Limits |              |
| Inorganic Arsenic | None        | 1632A           | 0.200      | 0.188 ✓ | 94 ✓             | 80-120                             |              |



ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 08/27/18

Calibration Verification (CALVER) Sample Summary  
Total Metals

Sample Name: CALVER 5

Units: ug/L  
Basis: NA

Test Notes:

| Analyte           | Prep Method | Analysis Method | True Value | Result  | Percent Recovery | CAS                                | Result Notes |
|-------------------|-------------|-----------------|------------|---------|------------------|------------------------------------|--------------|
|                   |             |                 |            |         |                  | Percent Recovery Acceptance Limits |              |
| Inorganic Arsenic | None        | 1632A           | 0.200      | 0.196 ✓ | 98 ✓             | 80-120                             |              |

|                                                                                                                                                         |                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Method 1632: (circle species)<br><div style="border: 1px solid black; border-radius: 50%; padding: 2px; display: inline-block;">TAs</div> AsIII MMA DMA | Service Request # : K1807478, K1807540, K1807578, K1807597, K1807828, K1807829 |
| Analysis For: As                                                                                                                                        |                                                                                |

| DATA |                 |                    |                    |                     |                 |           |        |                 |              |
|------|-----------------|--------------------|--------------------|---------------------|-----------------|-----------|--------|-----------------|--------------|
| Pos. | SAMPLE NUMBER   | Initial Sample (g) | Digest Volume (mL) | Aliquot Volume (mL) | Dilution Factor | peak area | net ng | net ng/L / ng/g | Comments     |
| 1    | CALBLK 0        | ~                  | ~                  | 50                  | ~               | 51.3630   | 0.00   | 0.0             |              |
| 2    | 0.5 ng wk std A | ~                  | ~                  | 50                  | ~               | 84.1410   | 0.61   | 12.2            | RR           |
| 3    | 10 ng wk std A  | ~                  | ~                  | 50                  | ~               | 574.8170  | 9.76   | 195.2           |              |
| 4    | 20 ng wk std A  | ~                  | ~                  | 50                  | ~               | 1046.6695 | 18.55  | 371.1           |              |
| 5    | 30 ng wk std A  | ~                  | ~                  | 50                  | ~               | 1458.8520 | 26.24  | 524.7           |              |
| 6    | CALBLK 1        | ~                  | ~                  | 50                  | ~               | 54.4485   | 0.06   | 1.2             |              |
| 7    | CALVER 1        | ~                  | ~                  | 50                  | ~               | 575.4470  | 9.77   | 195.4           | CALVER : 98% |
| 8    | CALBLK 2        | ~                  | ~                  | 50                  | ~               | 34.3070   | -0.32  | -6.4            |              |
| 9    | K1807478-001    | ~                  | ~                  | 1                   | 50              | 292.8840  | 4.50   | 4502.1          | Am 8/27/18   |
| 10   | K1807478-001    | ~                  | ~                  | 5                   | 10              | 1298.3555 | 23.24  | 4649.0          |              |
| 11   | K1807540-022    | ~                  | ~                  | 50                  | ~               | 1646.6770 | 29.74  | 594.8           | Am 8/27/18   |
| 12   | K1807540-022    | ~                  | ~                  | 25                  | 2               | 803.1380  | 14.01  | 560.5           |              |
| 13   | K1807578-001    | ~                  | ~                  | 25                  | 2               | 845.3030  | 14.80  | 592.0           |              |
| 14   | K1807578-001S   | ~                  | ~                  | 25                  | 2               | 1345.2420 | 24.12  | 964.8           | MS : 93%     |
| 15   | K1807578-001SD  | ~                  | ~                  | 25                  | 2               | 1282.5500 | 22.95  | 918.0           | MSD : 82%    |
| 16   | K1807578-005    | ~                  | ~                  | 10                  | 5               | 681.6320  | 11.75  | 1174.9          |              |
| 17   | K1807828-005    | ~                  | ~                  | 50                  | ~               | 93.2640   | 0.78   | 15.6            |              |
| 18   | K1807828-005S   | ~                  | ~                  | 50                  | ~               | 621.2550  | 10.62  | 212.5           | MS : 98%     |
| 19   | CALVER 2        | ~                  | ~                  | 50                  | ~               | 509.6650  | 8.54   | 170.9           | CALVER : 85% |
| 20   | CALBLK 3        | ~                  | ~                  | 50                  | ~               | 41.6800   | -0.18  | -3.6            |              |
| 21   | K1807828-005SD  | ~                  | ~                  | 50                  | ~               | 561.6960  | 9.51   | 190.3           | MSD : 87%    |
| 22   | K1807829-005    | ~                  | ~                  | 50                  | ~               | 283.0420  | 4.32   | 86.4            |              |
| 23   | K1807597-001    | ~                  | ~                  | 50                  | ~               | 37.1230   | -0.27  | -5.3            |              |
| 24   | K1807597-001S   | ~                  | ~                  | 50                  | ~               | 559.6290  | 9.47   | 189.5           | MS : 97%     |
| 25   | K1807597-001SD  | ~                  | ~                  | 50                  | ~               | 602.4500  | 10.27  | 205.5           | MSD : 105%   |

| Comments:       | wk std A : AA1-39-C      | Calibration: | ng  | net peak area | Calibration Factor |
|-----------------|--------------------------|--------------|-----|---------------|--------------------|
|                 | wk std B : AA1-39-F      |              |     |               |                    |
|                 | KBH4 : HG-AAS-3-I        |              | 30  | 1407.4890     | 46.9163            |
|                 | 4.8M HCl : HG-AAS-5-D    |              | 20  | 995.3065      | 49.7653            |
|                 | Tris-Buffer : HG-AAS-5-B |              | 10  | 523.4540      | 52.3454            |
|                 |                          |              | 0.5 | 32.7780       | 65.5560            |
|                 |                          |              |     |               | 53.6458 CF mean    |
|                 |                          |              |     |               | 8.24 CF Stdev      |
| CALVER/MS/MSD : |                          |              |     |               | 15.37 RSD          |

|                                                                                                 |                  |                        |
|-------------------------------------------------------------------------------------------------|------------------|------------------------|
| Analyst:<br> | Date:<br>8/27/18 | Page Number:<br>1 of 2 |
|-------------------------------------------------------------------------------------------------|------------------|------------------------|

|                                                                 |                                                                                |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------|
| Method 1632: (circle species)<br>TIA <sub>s</sub> AsIII MMA DMA | Service Request # : K1807478, K1807540, K1807578, K1807597, K1807828, K1807829 |
| Analysis For: As                                                |                                                                                |

[illegible]

|                 |                          |  |  |  |  |
|-----------------|--------------------------|--|--|--|--|
| Calibration:    | wk std A : AA1-39-C      |  |  |  |  |
|                 | wk std B : AA1-39-F      |  |  |  |  |
|                 | KBH4 : HG-AAS-3-I        |  |  |  |  |
|                 | 4.8M HCl : HG-AAS-5-D    |  |  |  |  |
|                 | Tris-Buffer : HG-AAS-5-B |  |  |  |  |
|                 |                          |  |  |  |  |
|                 |                          |  |  |  |  |
|                 |                          |  |  |  |  |
| CALVER/MS/MSD : |                          |  |  |  |  |

|                              |                  |                        |
|------------------------------|------------------|------------------------|
| Analyst:<br>Eunice M. Wilson | Date:<br>8/27/18 | Page Number:<br>2 of 2 |
|------------------------------|------------------|------------------------|

ALS Group USA, Corp.  
dba ALS Environmental  
Analytical Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**Sample Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** 08/03/18  
**Date Received:** 08/24/18

Total Inorganic Arsenic

Prep Method: None  
Analysis Method: 1632A  
Test Notes:

Units: ug/L  
Basis: NA

| Sample Name                             | Lab Code     | MRL  | MDL   | Dilution<br>Factor | Date<br>Extracted | Date<br>Analyzed | Result | Result<br>Notes |
|-----------------------------------------|--------------|------|-------|--------------------|-------------------|------------------|--------|-----------------|
| Rinsate Blank-Northern Pike 8/03        | K1807597-020 | 0.02 | 0.003 | 1                  | NA                | 10/02/18         | 0.011  | J,x             |
| Homogenization Blank-Northern Pike 8/03 | K1807597-021 | 0.02 | 0.003 | 1                  | NA                | 10/02/18         | ND     | x               |
| Homogenization Blank-Northern Pike 8/03 | K1807597-022 | 0.02 | 0.003 | 1                  | NA                | 10/02/18         | ND     | x               |
| Method Blank 1                          | K1807597-MB1 | 0.02 | 0.003 | 1                  | NA                | 10/02/18         | 0.008  | J               |
| Method Blank 2                          | K1807597-MB2 | 0.02 | 0.003 | 1                  | NA                | 10/02/18         | ND     |                 |
| Method Blank 3                          | K1807597-MB3 | 0.02 | 0.003 | 1                  | NA                | 10/02/18         | ND     |                 |
| Method Blank 4                          | K1807597-MB4 | 0.02 | 0.003 | 1                  | NA                | 10/02/18         | ND     |                 |
| Method Blank 5                          | K1807597-MB5 | 0.02 | 0.003 | 1                  | NA                | 10/02/18         | ND     |                 |

no blank qualification

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 10/02/18

Calibration Verification (CALVER) Sample Summary  
Total Metals

Sample Name: CALVER 1

Units: ug/L  
Basis: NA

Test Notes:

| Analyte           | Prep Method | Analysis Method | True Value | Result  | Percent Recovery | CAS Percent Recovery Acceptance Limits | Result Notes |
|-------------------|-------------|-----------------|------------|---------|------------------|----------------------------------------|--------------|
| Inorganic Arsenic | None        | 1632A           | 0.200      | 0.174 ✓ | 87 ✓             | 80-120                                 |              |

ALS Group USA, Corp.  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 10/02/18

Calibration Verification (CALVER) Sample Summary  
Total Metals

Sample Name: CALVER 2

Units: ug/L  
Basis: NA

Test Notes:

| Analyte           | Prep Method | Analysis Method | True Value | Result  | Percent Recovery | CAS                                | Result Notes |
|-------------------|-------------|-----------------|------------|---------|------------------|------------------------------------|--------------|
|                   |             |                 |            |         |                  | Percent Recovery Acceptance Limits |              |
| Inorganic Arsenic | None        | 1632A           | 0.200      | 0.186 ✓ | 93 ✓             | 80-120                             |              |

**ALS Group USA, Corp.**  
 dba ALS Environmental  
 QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 10/02/18

Calibration Verification (CALVER) Sample Summary  
 Total Metals

Sample Name: CALVER 3

Units: ug/L  
 Basis: NA

Test Notes:

| Analyte           | Prep Method | Analysis Method | True Value | Result  | Percent Recovery | CAS Percent Recovery Acceptance Limits | Result Notes |
|-------------------|-------------|-----------------|------------|---------|------------------|----------------------------------------|--------------|
| Inorganic Arsenic | None        | 1632A           | 0.200      | 0.211 ✓ | 106 ✓            | 80-120                                 |              |

**ALS Group USA, Corp.**  
dba ALS Environmental  
QA/QC Report

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks  
**LCS Matrix:** Water

**Service Request:** K1807597  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 10/02/18

Calibration Verification (CALVER) Sample Summary  
Total Metals

Sample Name: CALVER 4

Units: ug/L  
Basis: NA

Test Notes:

| Analyte           | Prep Method | Analysis Method | True Value | Result  | Percent Recovery | CAS Percent Recovery Acceptance Limits | Result Notes |
|-------------------|-------------|-----------------|------------|---------|------------------|----------------------------------------|--------------|
| Inorganic Arsenic | None        | 1632A           | 0.200      | 0.190 ✓ | 95 ✓             | 80-120                                 |              |



|                                                             |                                        |
|-------------------------------------------------------------|----------------------------------------|
| Method 1632: (circle species)<br><u>AsIII</u> AsIII MMA DMA | Service Request # : K1807597, K1809136 |
| Analysis For: As                                            |                                        |

| DATA |                 |                    |                    |                     |                 |           |        |                 |              |
|------|-----------------|--------------------|--------------------|---------------------|-----------------|-----------|--------|-----------------|--------------|
| Pos. | SAMPLE NUMBER   | Initial Sample (g) | Digest Volume (mL) | Aliquot Volume (mL) | Dilution Factor | peak area | net ng | net ng/L / ng/g | Comments     |
| 1    | CALBLK 0        | ~                  | ~                  | 50                  | ~               | 32.2465   | 0.00   | 0.0             | RR           |
| 2    | 0.5 ng wk std A | ~                  | ~                  | 50                  | ~               | 65.9735   | 0.63   | 12.6            |              |
| 3    | 10 ng wk std A  | ~                  | ~                  | 50                  | ~               | 527.4480  | 9.22   | 184.3           |              |
| 4    | 20 ng wk std A  | ~                  | ~                  | 50                  | ~               | 960.8910  | 17.28  | 345.7           |              |
| 5    | 30 ng wk std A  | ~                  | ~                  | 50                  | ~               | 1577.3065 | 28.76  | 575.2           |              |
| 6    | CALBLK 1        | ~                  | ~                  | 50                  | ~               | 53.3430   | 0.39   | 7.9             |              |
| 7    | CALVER 1        | ~                  | ~                  | 50                  | ~               | 500.4080  | 8.71   | 174.3           | CALVER : 87% |
| 8    | CALBLK 2        | ~                  | ~                  | 50                  | ~               | 29.2340   | -0.06  | -1.1            |              |
| 9    | K1807597-020    | ~                  | ~                  | 50                  | ~               | 62.4265   | 0.56   | 11.2            |              |
| 10   | K1807597-021    | ~                  | ~                  | 50                  | ~               | 30.5140   | -0.03  | -0.6            |              |
| 11   | K1807597-022    | ~                  | ~                  | 50                  | ~               | 30.8380   | -0.03  | -0.5            |              |
| 12   | K1809136-003    | ~                  | ~                  | 10                  | 5               | 730.3000  | 12.99  | 1299.3          |              |
| 13   | K1809136-003S   | ~                  | ~                  | 10                  | 5               | 1099.7280 | 19.87  | 1986.9          | MS : 69%     |
| 14   | K1809136-003SD  | ~                  | ~                  | 10                  | 5               | 1222.1630 | 22.15  | 2214.7          | MSD : 92%    |
| 15   | K1809136-017    | ~                  | ~                  | 10                  | 5               | 717.6190  | 12.76  | 1275.7          |              |
| 16   | K1809136-017S   | ~                  | ~                  | 10                  | 5               | 1210.5360 | 21.93  | 2193.1          | MS : 92%     |
| 17   | K1809136-017SD  | ~                  | ~                  | 10                  | 5               | 1200.0530 | 21.74  | 2173.6          | MSD : 90%    |
| 18   | K1809136-001    | ~                  | ~                  | 10                  | 5               | 1557.8250 | 28.39  | 2839.5          |              |
| 19   | CALVER 2        | ~                  | ~                  | 50                  | ~               | 533.0730  | 9.32   | 186.4           | CALVER : 93% |
| 20   | CALBLK 3        | ~                  | ~                  | 50                  | ~               | 35.8020   | 0.07   | 1.3             |              |
| 21   | K1809136-002    | ~                  | ~                  | 10                  | 5               | 542.7245  | 9.50   | 950.1           |              |
| 22   | K1809136-004    | ~                  | ~                  | 10                  | 5               | 434.3520  | 7.48   | 748.4           |              |
| 23   | K1809136-005    | ~                  | ~                  | 10                  | 5               | 1996.1910 | 36.55  | 3655.4          |              |
| 24   | K1809136-005    | ~                  | ~                  | 5                   | 10              | 1182.9605 | 21.42  | 4283.6          |              |
| 25   | K1809136-006    | ~                  | ~                  | 50                  | ~               | 53.0940   | 0.39   | 7.8             |              |

| Comments:       | wk std A : AA1-39-C      | Calibration: | ng  | net peak area | Calibration Factor |          |
|-----------------|--------------------------|--------------|-----|---------------|--------------------|----------|
|                 | wk std B : AA1-39-F      |              | 30  | 1545.0600     | 51.5020            |          |
|                 | KBH4 : HG-AAS-3-I        |              | 20  | 928.6445      | 46.4322            |          |
|                 | 4.8M HCl : HG-AAS-5-D    |              | 10  | 495.2015      | 49.5202            |          |
|                 | Tris-Buffer : HG-AAS-5-E |              | 0.5 | 33.7270       | 67.4540            |          |
|                 |                          |              |     |               | 53.7271            | CF mean  |
|                 |                          |              |     |               | 9.39               | CF Stdev |
| CALVER/MS/MSD : |                          |              |     |               | 17.47              | RSD      |

|                                                                                              |                 |                     |
|----------------------------------------------------------------------------------------------|-----------------|---------------------|
| Analyst:  | Date: 10/2/18 ✓ | Page Number: 1 of 2 |
|----------------------------------------------------------------------------------------------|-----------------|---------------------|

### Analysis For: As

[illegible]

|                 |                          |  |  |  |  |
|-----------------|--------------------------|--|--|--|--|
| Calibration:    | wk std A : AA1-39-C      |  |  |  |  |
|                 | wk std B : AA1-39-F      |  |  |  |  |
|                 | KBH4 : HG-AAS-3-I        |  |  |  |  |
|                 | 4.8M HCl : HG-AAS-5-D    |  |  |  |  |
|                 | Tris-Buffer : HG-AAS-5-E |  |  |  |  |
|                 |                          |  |  |  |  |
|                 |                          |  |  |  |  |
| CALVER/MS/MSD : |                          |  |  |  |  |

|                               |                  |                        |
|-------------------------------|------------------|------------------------|
| Analyst:<br>Dumaine McAlister | Date:<br>10/2/18 | Page Number:<br>2 of 2 |
|-------------------------------|------------------|------------------------|

## **SECTION 4**

### **LABORATORY CASE NARRATIVES AND CHAIN-OF-CUSTODY RECORDS**



**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study  
**Sample Matrix:** Fish Tissue

**Service Request:** K1807185  
**Date Received:** 07/28/2018

#### CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

#### Sample Receipt:

Thirty fish tissue were received for analysis at ALS Environmental on 07/28/2018. As instructed, the discreet samples were composited at the laboratory to create six composite samples: EPA-NP-A1, EPA-NP-A2, EPA-NP-A3, EPA-NP-A4, EPA-NP-A5 and EPA-NP-A6. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored frozen at -20°C upon receipt at the laboratory.

#### Semivola GC:

No significant anomalies were noted with this analysis.

#### Metals:

Method 1632, 08/30/18: The matrix spike recoveries of Inorganic Arsenic for sample EPA-NP-A1 were outside control criteria. Recovery in the Ongoing Precision and Recovery (OPR) sample was acceptable, which indicated the analytical batch was in control. The matrix spike outliers suggested a potential low bias in this matrix. No further corrective action was appropriate.

Method 6010C, 08/30/2018: The Relative Standard Deviation (RSD) for the replicate analysis of Calcium in the Batch QC sample was outside the normal ALS control limits. The samples were homogenized, freeze dried, then ground prior to digestion, however this was not sufficient to achieve a completely uniform distribution of Calcium in the tissue.

Method 7742, 08/31/2018: The matrix spike recoveries of Selenium for sample EPA-NP-A1 were outside control criteria (recoveries of 74% versus a lower control limit of 75%). Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicated the analytical batch was in control. No further corrective action was appropriate.

Approved by

Noel D. Davis

Date

09/25/2018

Upper Columbia River Northern Pike Sampling  
(LAB COPY)

Date Shipped: 7/27/2018

Contact Name: Kelly O'Neal

Contact Phone: 812-371-7476

## CHAIN OF CUSTODY RECORD

Project Code: SFP-139A

Cooler #: 1

No: 10-072718-120920-0001

Lab: ALS Laboratory Group - Kelso

CarrierName: Spokane Courier Delivery

AirbillNo: Hand Delivery

| Sample Identifier | CLP Sample No. | Matrix/Sampler   | Coll. Method | Analysis/Turnaround (Days) | Tag/Preservative/Bottles | Location     | Collection Date/Time | For Lab Use Only |
|-------------------|----------------|------------------|--------------|----------------------------|--------------------------|--------------|----------------------|------------------|
| EPA-NP-A-001      | 18304600       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 1 (OC) (1)               | EPA-NP-A-001 | 07/24/2018 10:08     |                  |
| EPA-NP-A-002      | 18304601       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 2 (OC) (1)               | EPA-NP-A-002 | 07/24/2018 10:30     |                  |
| EPA-NP-A-003      | 18304602       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 3 (OC) (1)               | EPA-NP-A-003 | 07/24/2018 10:53     |                  |
| EPA-NP-A-004      | 18304603       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 4 (OC) (1)               | EPA-NP-A-004 | 07/24/2018 11:52     |                  |
| EPA-NP-A-005      | 18304604       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 5 (OC) (1)               | EPA-NP-A-005 | 07/24/2018 13:43     |                  |
| EPA-NP-A-006      | 18304605       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 6 (OC) (1)               | EPA-NP-A-006 | 07/24/2018 13:46     |                  |
| EPA-NP-A-007      | 18304606       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 7 (OC) (1)               | EPA-NP-A-007 | 07/24/2018 14:07     |                  |
| EPA-NP-A-008      | 18304607       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 8 (OC) (1)               | EPA-NP-A-008 | 07/24/2018 14:56     |                  |
| EPA-NP-A-009      | 18304608       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 9 (OC) (1)               | EPA-NP-A-009 | 07/24/2018 15:30     |                  |
| EPA-NP-A-010      | 18304609       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 10 (OC) (1)              | EPA-NP-A-010 | 07/24/2018 15:36     |                  |

## Special Instructions:

TAL Metals: EPA Method 6010C

Inorganic Arsenic: EPA Method 1632A

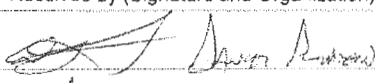
Percent Lipids

Percent Moisture

Shipment for Case Complete? N

Samples Transferred From Chain of Custody #

Analysis Key: MultiAnalyte=Refer to Special Instructions

| Items/Reason | Relinquished by (Signature and Organization)                                        | Date/Time          | Received by (Signature and Organization)                                                      | Date/Time       | Sample Condition Upon Receipt |
|--------------|-------------------------------------------------------------------------------------|--------------------|-----------------------------------------------------------------------------------------------|-----------------|-------------------------------|
|              |  | 7/27/2018<br>14:00 | <br>ALS-K | 7-28-18<br>1245 |                               |

K1807185  
K180715 KA 2-118

Upper Columbia River Northern Pike Sampling  
(LAB COPY)

Date Shipped: 7/27/2018

Contact Name: Kelly O'Neal

Contact Phone: 812-371-7476

CHAIN OF CUSTODY RECORD

Project Code: SFP-139A

Cooler #: 2

No: 10-072718-123510-0002

Lab: ALS Laboratory Group - Kelso

Carrier Name: Spokane Courier Delivery

Airbill No: Hand Delivery

| Sample Identifier | CLP Sample No. | Matrix/Sampler   | Coll. Method | Analysis/Turnaround (Days) | Tag/Preservative/Bottles | Location     | Collection Date/Time | For Lab Use Only |
|-------------------|----------------|------------------|--------------|----------------------------|--------------------------|--------------|----------------------|------------------|
| EPA-NP-A-011      | 18304610       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 11 (OC) (1)              | EPA-NP-A-011 | 07/25/2018 11:00     |                  |
| EPA-NP-A-012      | 18304611       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 12 (OC) (1)              | EPA-NP-A-012 | 07/25/2018 12:37     |                  |
| EPA-NP-A-013      | 18304612       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 13 (OC) (1)              | EPA-NP-A-013 | 07/25/2018 12:52     |                  |
| EPA-NP-A-014      | 18304613       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 14 (OC) (1)              | EPA-NP-A-014 | 07/25/2018 13:02     |                  |
| EPA-NP-A-015      | 18304614       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 15 (OC) (1)              | EPA-NP-A-015 | 07/25/2018 13:10     |                  |
| EPA-NP-A-016      | 18304615       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 16 (OC) (1)              | EPA-NP-A-016 | 07/25/2018 14:16     |                  |
| EPA-NP-A-017      | 18304616       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 17 (OC) (1)              | EPA-NP-A-017 | 07/25/2018 15:01     |                  |
| EPA-NP-A-018      | 18304617       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 18 (OC) (1)              | EPA-NP-A-018 | 07/25/2018 15:11     |                  |
| EPA-NP-A-019      | 18304618       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 19 (OC) (1)              | EPA-NP-A-019 | 07/25/2018 15:43     |                  |
| EPA-NP-A-020      | 18304619       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 20 (OC) (1)              | EPA-NP-A-020 | 07/25/2018 16:06     |                  |

Special Instructions:

TAL Metals: EPA Method 6010C

Inorganic Arsenic: EPA Method 1632A

Percent Lipids

Percent Moisture

Shipment for Case Complete? N

Samples Transferred From Chain of Custody #

Analysis Key: MultiAnalyte=Refer to Special Instructions

| Items/Reason | Relinquished by (Signature and Organization) | Date/Time          | Received by (Signature and Organization) | Date/Time       | Sample Condition Upon Receipt |
|--------------|----------------------------------------------|--------------------|------------------------------------------|-----------------|-------------------------------|
|              | Kelly O'Neal                                 | 7/27/2018<br>14:00 | [Signature] David Andrew<br>ALS K        | 7-28-18<br>1045 |                               |

Upper Columbia River Northern Pike Sampling  
(LAB COPY)

Date Shipped: 7/27/2018

Contact Name: Kelly O'Neal

Contact Phone: 812-371-7476

## CHAIN OF CUSTODY RECORD

Project Code: SFP-139A

Cooler #: 3

No: 10-072718-123929-0003

Lab: ALS Laboratory Group - Kelso

CarrierName: Spokane Courier Delivery

AirbillNo: Hand Delivery

| Sample Identifier | CLP Sample No. | Matrix/Sampler   | Coll. Method | Analysis/Turnaround (Days) | Tag/Preservative/Bottles | Location     | Collection Date/Time | For Lab Use Only |
|-------------------|----------------|------------------|--------------|----------------------------|--------------------------|--------------|----------------------|------------------|
| EPA-NP-A-021      | 18304620       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 21 (OC) (1)              | EPA-NP-A-021 | 07/25/2018 17:00     |                  |
| EPA-NP-A-022      | 18304621       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 22 (OC) (1)              | EPA-NP-A-022 | 07/25/2018 17:10     |                  |
| EPA-NP-A-023      | 18304622       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 23 (OC) (1)              | EPA-NP-A-023 | 07/25/2018 17:17     |                  |
| EPA-NP-A-024      | 18304623       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 24 (OC) (1)              | EPA-NP-A-024 | 07/25/2018 17:24     |                  |
| EPA-NP-A-025      | 18304624       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 25 (OC) (1)              | EPA-NP-A-025 | 07/26/2018 10:45     |                  |
| EPA-NP-A-026      | 18304625       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 26 (OC) (1)              | EPA-NP-A-026 | 07/26/2018 10:57     |                  |
| EPA-NP-A-027      | 18304626       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 27 (OC) (1)              | EPA-NP-A-027 | 07/26/2018 11:11     |                  |
| EPA-NP-A-028      | 18304627       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 28 (OC) (1)              | EPA-NP-A-028 | 07/26/2018 11:27     |                  |
| EPA-NP-A-029      | 18304628       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 29 (OC) (1)              | EPA-NP-A-029 | 07/26/2018 11:41     |                  |
| EPA-NP-A-030      | 18304629       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 30 (OC) (1)              | EPA-NP-A-030 | 07/26/2018 12:30     |                  |

## Special Instructions:

TAL Metals: EPA Method 6010C

Inorganic Arsenic: EPA Method 1632A

Percent Lipids

Percent Moisture

Shipment for Case Complete? N

Samples Transferred From Chain of Custody #

Analysis Key: MultiAnalyte=Refer to Special Instructions

| Items/Reason | Relinquished by (Signature and Organization) | Date/Time          | Received by (Signature and Organization) | Date/Time       | Sample Condition Upon Receipt |
|--------------|----------------------------------------------|--------------------|------------------------------------------|-----------------|-------------------------------|
|              | <i>Kelly O'Neal</i>                          | 7/27/2018<br>14:00 | <i>[Signature]</i><br>ALS-K              | 7-28-18<br>1245 |                               |



## Cooler Receipt and Preservation Form

PC MM

Client Upper Columbia River Northwest Pine Services Service Request K18-0715 <sup>AP 3-1-18</sup>  
 Received: 7-31-18 Opened: 7-31-18 By: ASP Unloaded: 7-31-18 By: ASP

1. Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered  
 2. Samples were received in: (circle) Cooler Box Envelope Other NA  
 3. Were custody seals on coolers? NA Y N If yes, how many and where? 2 Tubs Front & Back  
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N

| Raw Cooler Temp | Corrected Cooler Temp | Raw Temp Blank | Corrected Temp Blank | Corr. Factor | Thermometer ID | Cooler/COC ID | Tracking Number | Filed |
|-----------------|-----------------------|----------------|----------------------|--------------|----------------|---------------|-----------------|-------|
| -50.0           | -50.2                 | NA             | NA                   | -0.2         | 370            | NA            | NA              |       |
| -45.7           | -45.7                 | Frozen         | Frozen               | 0.0          | 360            |               |                 |       |
| -39.8           | -39.9                 | Frozen         | Frozen               | -0.1         | 308            |               |                 |       |
| -50.0           | -50.1                 | Frozen         | Frozen               | -0.1         | 371            |               |                 |       |
| -48.1           | -48.1                 | NA             | NA                   | 0.0          | 386            |               |                 |       |

4. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves  
 5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N  
 6. Were samples received in good condition (temperature, unbroken)? Indicate in the table below. NA Y N  
 If applicable, tissue samples were received: Frozen Partially Thawed Thawed  
 7. Were all sample labels complete (i.e. analysis, preservation, etc.)? NA Y N  
 8. Did all sample labels and tags agree with custody papers? Indicate major discrepancies in the table on page 2. NA Y N  
 9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N  
 10. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA Y N  
 11. Were VOA vials received without headspace? Indicate in the table below. NA Y N  
 12. Was C12/Res negative? NA Y N

| Sample ID on Bottle | Sample ID on COC | Identified by: |
|---------------------|------------------|----------------|
|                     |                  |                |
|                     |                  |                |
|                     |                  |                |

| Sample ID | Bottle Count<br>Bottle Type | Out of<br>Temp | Head-<br>space | Broke | pH | Reagent | Volume<br>added | Reagent Lot<br>Number | Initials | Time |
|-----------|-----------------------------|----------------|----------------|-------|----|---------|-----------------|-----------------------|----------|------|
|           |                             |                |                |       |    |         |                 |                       |          |      |
|           |                             |                |                |       |    |         |                 |                       |          |      |
|           |                             |                |                |       |    |         |                 |                       |          |      |
|           |                             |                |                |       |    |         |                 |                       |          |      |
|           |                             |                |                |       |    |         |                 |                       |          |      |
|           |                             |                |                |       |    |         |                 |                       |          |      |

## Notes, Discrepancies, &amp; Resolutions:

SAMPLES RECEIVED SATURDAY, 7-28-18. SAMPLES WERE FROZEN ON DRY ICE  
AND IMMEDIATELY STORED IN FREEZER



PC MH

## Cooler Receipt and Preservation Form

K1807185

Client TECK Service Request K18 07185 8-1-18  
 Received: 7-31-18 Opened: 7-31-18 By: ASP Unloaded: 7-31-18 By: ASP

1. Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered  
 2. Samples were received in: (circle) Cooler Box Envelope Other NA  
 3. Were custody seals on coolers? NA Y N If yes, how many and where? 2 TOP FRONT & BACK  
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N

| Raw Cooler Temp | Corrected Cooler Temp | Raw Temp Blank | Corrected Temp Blank | Corr. Factor | Thermometer ID | Cooler/COC ID | Tracking Number | NA | Filed |
|-----------------|-----------------------|----------------|----------------------|--------------|----------------|---------------|-----------------|----|-------|
| -48.0           | -47.9                 | Frozen         | Frozen               | 10.1         | 391            | NA            |                 | NA |       |
|                 |                       |                |                      |              |                |               |                 |    |       |
|                 |                       |                |                      |              |                |               |                 |    |       |
|                 |                       |                |                      |              |                |               |                 |    |       |
|                 |                       |                |                      |              |                |               |                 |    |       |
|                 |                       |                |                      |              |                |               |                 |    |       |

4. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves  
 5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N  
 6. Were samples received in good condition (temperature, unbroken)? Indicate in the table below. NA Y N  
 If applicable, tissue samples were received: Frozen Partially Thawed Thawed  
 7. Were all sample labels complete (i.e. analysis, preservation, etc.)? NA Y N  
 8. Did all sample labels and tags agree with custody papers? Indicate major discrepancies in the table on page 2. NA Y N  
 9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N  
 10. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA Y N  
 11. Were VOA vials received without headspace? Indicate in the table below. NA Y N  
 12. Was C12/Res negative? NA Y N

| Sample ID on Bottle | Sample ID on COC | Identified by: |
|---------------------|------------------|----------------|
|                     |                  |                |
|                     |                  |                |
|                     |                  |                |

| Sample ID | Bottle Count | Bottle Type | Out of Temp | Head-space | Broke | pH | Reagent | Volume added | Reagent Lot Number | Initials | Time |
|-----------|--------------|-------------|-------------|------------|-------|----|---------|--------------|--------------------|----------|------|
|           |              |             |             |            |       |    |         |              |                    |          |      |
|           |              |             |             |            |       |    |         |              |                    |          |      |
|           |              |             |             |            |       |    |         |              |                    |          |      |
|           |              |             |             |            |       |    |         |              |                    |          |      |
|           |              |             |             |            |       |    |         |              |                    |          |      |

Notes, Discrepancies, &amp; Resolutions:

11807185

| Size Group A |       |              |             |            |                   |           |
|--------------|-------|--------------|-------------|------------|-------------------|-----------|
| Date         | Time  | ID           | Length (mm) | Weight (g) | Fillet Weight (g) | Composite |
| 25-Jul-18    | 17:24 | EPA-NP-A-024 | 390         | 415        | 90                | EPA-NP-A1 |
| 25-Jul-18    | 14:16 | EPA-NP-A-016 | 410         | 545        | 95                | EPA-NP-A1 |
| 25-Jul-18    | 17:00 | EPA-NP-A-021 | 420         | 555        | 90                | EPA-NP-A1 |
| 24-Jul-18    | 10:30 | EPA-NP-A-002 | 445         | 590        | 136               | EPA-NP-A1 |
| 24-Jul-18    | 13:43 | EPA-NP-A-005 | 449         | 600        | 100               | EPA-NP-A1 |
| 25-Jul-18    | 13:02 | EPA-NP-A-014 | 375         | 340        | 75                | EPA-NP-A2 |
| 24-Jul-18    | 10:53 | EPA-NP-A-003 | 410         | 495        | 95                | EPA-NP-A2 |
| 25-Jul-18    | 13:10 | EPA-NP-A-015 | 425         | 510        | 170               | EPA-NP-A2 |
| 25-Jul-18    | 15:01 | EPA-NP-A-017 | 440         | 480        | 110               | EPA-NP-A2 |
| 24-Jul-18    | 13:46 | EPA-NP-A-006 | 445         | 555        | 120               | EPA-NP-A2 |
| 25-Jul-18    | 12:52 | EPA-NP-A-013 | 395         | 375        | 90                | EPA-NP-A3 |
| 26-Jul-18    | 11:41 | EPA-NP-A-029 | 415         | 420        | 105               | EPA-NP-A3 |
| 25-Jul-18    | 17:17 | EPA-NP-A-023 | 425         | 525        | 110               | EPA-NP-A3 |
| 26-Jul-18    | 10:57 | EPA-NP-A-026 | 440         | 525        | 140               | EPA-NP-A3 |
| 25-Jul-18    | 17:10 | EPA-NP-A-022 | 449         | 555        | 170               | EPA-NP-A3 |
| 25-Jul-18    | 15:11 | EPA-NP-A-018 | 370         | 250        | 95                | EPA-NP-A4 |
| 24-Jul-18    | 15:36 | EPA-NP-A-010 | 410         | 500        | 130               | EPA-NP-A4 |
| 25-Jul-18    | 16:06 | EPA-NP-A-020 | 430         | 525        | 110               | EPA-NP-A4 |
| 24-Jul-18    | 14:56 | EPA-NP-A-008 | 440         | 495        | 120               | EPA-NP-A4 |
| 26-Jul-18    | 11:11 | EPA-NP-A-027 | 449         | 495        | 90                | EPA-NP-A4 |
| 24-Jul-18    | 10:08 | EPA-NP-A-001 | 375         | 350        | 100               | EPA-NP-A5 |
| 25-Jul-18    | 15:43 | EPA-NP-A-019 | 410         | 425        | 95                | EPA-NP-A5 |
| 26-Jul-18    | 10:45 | EPA-NP-A-025 | 420         | 495        | 90                | EPA-NP-A5 |
| 26-Jul-18    | 12:30 | EPA-NP-A-030 | 440         | 570        | 130               | EPA-NP-A5 |
| 24-Jul-18    | 11:52 | EPA-NP-A-004 | 445         | 605        | 140               | EPA-NP-A5 |
| 24-Jul-18    | 15:30 | EPA-NP-A-009 | 380         | 350        | 115               | EPA-NP-A6 |
| 26-Jul-18    | 11:27 | EPA-NP-A-028 | 410         | 440        | 110               | EPA-NP-A6 |
| 25-Jul-18    | 12:37 | EPA-NP-A-012 | 425         | 585        | 160               | EPA-NP-A6 |
| 24-Jul-18    | 14:07 | EPA-NP-A-007 | 440         | 595        | 135               | EPA-NP-A6 |
| 25-Jul-18    | 11:00 | EPA-NP-A-011 | 445         | 600        | 160               | EPA-NP-A6 |

## Service Request Summary

**Folder #:** K1807185  
**Client Name:** Teck American Incorporated  
**Project Name:** 2018 Northern Pike Tissue Study  
**Project Number:** SFP-139A  
**P.O. Number:**

**Report To:** Cristy Kessel  
 Teck American Incorporated  
 501 North Riverpoint Blvd., Suite 300  
 Spokane, WA 99202

**Phone Number:** 509-623-4530  
**Cell Number:** 509-496-1160  
**Fax Number:**  
**E-mail:** cristy.kessel@teck.com

**Project Chemist:** Mark Harris  
**Logged By:** DPLIMPTON  
**Date Received:** 7/28/18  
**Time Received:** 1245  
**Archive?** N  
**Folder Due Date:** 8/29/18  
**Internal Due Date:** 8/23/18  
**QAP:** LAB QAP  
**Qualifier Set:** Lab Standard  
**Formset:** Lab Standard  
**Report to MDL?:** Y  
**Merged?:** Y **Batch QC?:** N  
**PC Approved?:** N  
**State of Sampling Location:** WA  
**EDD:** No EDD Specified

36 - 1 Gal-Plastic Bag Ziplock - Gallon Unpreserved

**Location:** TISSUE 46 (SMO)

| Lab Samp No. | Client Samp No. | Matrix      | Collected | Metals              |                  |                 |                 |            |                                             |                         |                  |                     |                    | SVG            | SMO                      |                        |
|--------------|-----------------|-------------|-----------|---------------------|------------------|-----------------|-----------------|------------|---------------------------------------------|-------------------------|------------------|---------------------|--------------------|----------------|--------------------------|------------------------|
|              |                 |             |           | 1631app/ Hg LL<br>T | 1632/ As Inorg T | 6010C/ Metals T | 6020A/ Metals T | 7742/ Se T | Calculation/<br>Moisture<br>Calc_ FreezeDry | Composite/<br>Composite | Frz Dry/ Frz Dry | Homogen/<br>Homogen | None/<br>MISC_MET1 | Lipids/ LIPIDS | Archive/ Archive<br>-20C | Archive/ Archive<br>RT |
| K1807185-001 | EPA-NP-A-024    | Fish Tissue | 7/25/18   | 1724                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-002 | EPA-NP-A-016    | Fish Tissue | 7/25/18   | 1416                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-003 | EPA-NP-A-021    | Fish Tissue | 7/25/18   | 1700                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-004 | EPA-NP-A-002    | Fish Tissue | 7/24/18   | 1030                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-005 | EPA-NP-A-005    | Fish Tissue | 7/24/18   | 1343                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-006 | EPA-NP-A1       | Fish Tissue | 7/25/18   |                     | IV               | IV              | IV              | IV         | IV                                          |                         | IV               | IV                  | IV(C)              | IV             | IV(C)                    | IV                     |
| K1807185-007 | EPA-NP-A-014    | Fish Tissue | 7/25/18   | 1302                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-008 | EPA-NP-A-003    | Fish Tissue | 7/24/18   | 1053                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-009 | EPA-NP-A-015    | Fish Tissue | 7/25/18   | 1310                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-010 | EPA-NP-A-017    | Fish Tissue | 7/25/18   | 1501                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-011 | EPA-NP-A-006    | Fish Tissue | 7/24/18   | 1346                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-012 | EPA-NP-A2       | Fish Tissue | 7/25/18   |                     | IV               | IV              | IV              | IV         | IV                                          |                         | IV               | IV                  | IV(C)              | IV             | IV(C)                    | IV                     |
| K1807185-013 | EPA-NP-A-013    | Fish Tissue | 7/25/18   | 1252                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-014 | EPA-NP-A-029    | Fish Tissue | 7/26/18   | 1141                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-015 | EPA-NP-A-023    | Fish Tissue | 7/25/18   | 1717                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-016 | EPA-NP-A-026    | Fish Tissue | 7/26/18   | 1057                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-017 | EPA-NP-A-022    | Fish Tissue | 7/25/18   | 1710                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-018 | EPA-NP-A3       | Fish Tissue | 7/26/18   |                     | IV               | IV              | IV              | IV         | IV                                          |                         | IV               | IV                  | IV(C)              | IV             | IV(C)                    | IV                     |
| K1807185-019 | EPA-NP-A-018    | Fish Tissue | 7/25/18   | 1511                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-020 | EPA-NP-A-010    | Fish Tissue | 7/24/18   | 1536                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |

## Service Request Summary

**Folder #:** K1807185  
**Client Name:** Teck American Incorporated  
**Project Name:** 2018 Northern Pike Tissue Study  
**Project Number:** SFP-139A  
**P.O. Number:**

**Report To:** Cristy Kessel  
 Teck American Incorporated  
 501 North Riverpoint Blvd., Suite 300  
 Spokane, WA 99202

**Phone Number:** 509-623-4530  
**Cell Number:** 509-496-1160  
**Fax Number:**  
**E-mail:** cristy.kessel@teck.com

**Project Chemist:** Mark Harris  
**Logged By:** DPLIMPTON  
**Date Received:** 7/28/18  
**Time Received:** 1245  
**Archive?** N

**Folder Due Date:** 8/29/18  
**Internal Due Date:** 8/23/18

**QAP:** LAB QAP

**Qualifier Set:** Lab Standard

**Formset:** Lab Standard

**Report to MDL?:** Y

**Merged?:** Y **Batch QC?:** N

**PC Approved?:** N

**State of Sampling Location:** WA

**EDD:** No EDD Specified

36 - 1 Gal-Plastic Bag Ziplock - Gallon Unpreserved

**Location:** TISSUE 46 (SMO)

|              |              |             |         | Metals              |                  |                 |                 |            |                                            |                         |                  |                     |                    | SVG            | SMO                      |                        |
|--------------|--------------|-------------|---------|---------------------|------------------|-----------------|-----------------|------------|--------------------------------------------|-------------------------|------------------|---------------------|--------------------|----------------|--------------------------|------------------------|
|              |              |             |         | 1631app/ Hg LL<br>T | 1632/ As Inorg T | 6010C/ Metals T | 6020A/ Metals T | 7742/ Sc T | Calculation/<br>Moisture<br>Calc_FreezeDry | Composite/<br>Composite | Frz Dry/ Frz Dry | Homogen/<br>Homogen | None/<br>MISC_MET1 | Lipids/ LIPIDS | Archive/ Archive<br>-20C | Archive/ Archive<br>RT |
| K1807185-021 | EPA-NP-A-020 | Fish Tissue | 7/25/18 | 1606                |                  |                 |                 |            |                                            | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-022 | EPA-NP-A-008 | Fish Tissue | 7/24/18 | 1456                |                  |                 |                 |            |                                            | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-023 | EPA-NP-A-027 | Fish Tissue | 7/26/18 | 1111                |                  |                 |                 |            |                                            | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-024 | EPA-NP-A4    | Fish Tissue | 7/26/18 |                     | IV               | IV              | IV              | IV         | IV                                         |                         | IV               | IV                  | IV(C)              | IV             | IV(C)                    | IV                     |
| K1807185-025 | EPA-NP-A-001 | Fish Tissue | 7/24/18 | 1008                |                  |                 |                 |            |                                            | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-026 | EPA-NP-A-019 | Fish Tissue | 7/25/18 | 1543                |                  |                 |                 |            |                                            | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-027 | EPA-NP-A-025 | Fish Tissue | 7/26/18 | 1045                |                  |                 |                 |            |                                            | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-028 | EPA-NP-A-030 | Fish Tissue | 7/26/18 | 1230                |                  |                 |                 |            |                                            | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-029 | EPA-NP-A-004 | Fish Tissue | 7/24/18 | 1152                |                  |                 |                 |            |                                            | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-030 | EPA-NP-A5    | Fish Tissue | 7/26/18 |                     | IV               | IV              | IV              | IV         | IV                                         |                         | IV               | IV                  | IV(C)              | IV             | IV(C)                    | IV                     |
| K1807185-031 | EPA-NP-A-009 | Fish Tissue | 7/24/18 | 1530                |                  |                 |                 |            |                                            | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-032 | EPA-NP-A-028 | Fish Tissue | 7/26/18 | 1127                |                  |                 |                 |            |                                            | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-033 | EPA-NP-A-012 | Fish Tissue | 7/25/18 | 1237                |                  |                 |                 |            |                                            | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-034 | EPA-NP-A-007 | Fish Tissue | 7/24/18 | 1407                |                  |                 |                 |            |                                            | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-035 | EPA-NP-A-011 | Fish Tissue | 7/25/18 | 1100                |                  |                 |                 |            |                                            | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807185-036 | EPA-NP-A6    | Fish Tissue | 7/26/18 |                     | IV               | IV              | IV              | IV         | IV                                         |                         | IV               | IV                  | IV(C)              | IV             | IV(C)                    | IV                     |

**Folder Comments:**

## Service Request Summary

**Folder #:** K1807185  
**Client Name:** Teck American Incorporated  
**Project Name:** 2018 Northern Pike Tissue Study  
**Project Number:** SFP-139A  
**P.O. Number:**

**Report To:** Cristy Kessel  
 Teck American Incorporated  
 501 North Riverpoint Blvd., Suite 300  
 Spokane, WA 99202  
**Phone Number:** 509-623-4530  
**Cell Number:** 509-496-1160  
**Fax Number:**  
**E-mail:** cristy.kessel@teck.com

**Project Chemist:** Mark Harris  
**Logged By:** DPLIMPTON  
**Date Received:** 7/28/18  
**Time Received:** 1245  
**Archive?** N  
**Folder Due Date:** 8/29/18  
**Internal Due Date:** 8/23/18  
**QAP:** LAB QAP  
**Qualifier Set:** Lab Standard  
**Formset:** Lab Standard  
**Report to MDL?:** Y  
**Merged?:** Y **Batch QC?:** N  
**PC Approved?:** N  
**State of Sampling Location:** WA  
**EDD:** No EDD Specified

36 - 1 Gal-Plastic Bag Ziplock - Gallon Unpreserved

**Location:** TISSUE 46 (SMO)

**Composite Instructions:** Skin off. Both fillets w/ belly flap. Homogenize fillets individually. Use equal portions by mass for the composites. Archive leftover frozen. Use the new blender with titanium blades.

**MS/MSD/SRM and a triplicate per 20 required if ample mass. Choose QC samples.**

### Test Comments:

| Group  | Test/Method          | Samples                               | Comments                                              |
|--------|----------------------|---------------------------------------|-------------------------------------------------------|
| Metals | As Inorg T/1632      | 6, 12, 18, 24, 30, 36                 | Inorg-As                                              |
| Metals | Composite/Composite  | 1-5, 7-11, 13-17, 19-23, 25-29, 31-35 | Composite 5 tissue samples into 1 sample for analysis |
| Metals | Hg LL T/1631app      | 6, 12, 18, 24, 30, 36                 | Hg                                                    |
| Metals | Metals T/6010C       | 6, 12, 18, 24, 30, 36                 | Al,Ca,Fe,Mg,K,S,Na                                    |
| Metals | Metals T/6020A       | 6, 12, 18, 24, 30, 36                 | Sb,As,Ba,Be,Cd,Cr,Co,Cu,Pb,Mn,Ni,Se,Ag,Tl,U,V,Zn      |
| SMO    | Archive -20C/Archive | 1-5, 7-11, 13-17, 19-23, 25-29, 31-35 | Per month.                                            |
| SMO    | Archive RT/Archive   | 6, 12, 18, 24, 30, 36                 | Per month.                                            |

| Test/Method    | Samples               | Elements                                                                                                                                                              |
|----------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6010C/Metals T | 6, 12, 18, 24, 30, 36 | Aluminum / Calcium / Iron / Magnesium / Potassium / Sodium / Sulfur                                                                                                   |
| 6020A/Metals T | 6, 12, 18, 24, 30, 36 | Antimony / Arsenic / Barium / Beryllium / Cadmium / Chromium / Cobalt / Copper / Lead / Manganese / Nickel / Selenium / Silver / Thallium / Uranium / Vanadium / Zinc |
| None/MISC_MET1 | 6, 12, 18, 24, 30, 36 | Unknown                                                                                                                                                               |



**Client:** Teck American Incorporated  
**Project:** 2018 Northern Pike Tissue Study  
**Sample Matrix:** Fish Tissue

**Service Request:** K1807189  
**Date Received:** 07/28/2018

#### CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

#### Sample Receipt:

Thirty fish tissue samples were received for analysis at ALS Environmental on 07/28/2018. As instructed, the discreet samples were composited at the laboratory to create six composite samples: EPA-NP-B1, EPA-NP-B2, EPA-NP-B3, EPA-NP-B4, EPA-NP-B5 and EPA-NP-B6. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored frozen at -20°C upon receipt at the laboratory.

#### Semivola GC:

No significant anomalies were noted with this analysis.

#### Metals:

Method 1632, 08/30/18: The matrix spike recoveries of Inorganic Arsenic for sample EPA-NP-B1 were outside control criteria. Recovery in the Ongoing Precision and Recovery (OPR) sample was acceptable, which indicated the analytical batch was in control. The matrix spike outliers suggested a potential low bias in this matrix. No further corrective action was appropriate.

Method 6010C, 08/30/2018: The Relative Standard Deviation (RSD) for the replicate analysis of Calcium in sample EPA-NP-B1 was outside the normal ALS control limits. The samples were homogenized, freeze dried, then ground prior to digestion, however this was not sufficient to achieve a completely uniform distribution of Calcium in the tissue.

Method 7742, 08/31/2018: The matrix spike recoveries of Selenium for the Batch QC sample were outside control criteria (recoveries of 74% versus a lower control limit of 75%). Recovery in the Laboratory Control Sample (LCS) was acceptable, which indicated the analytical batch was in control. No further corrective action was appropriate.

Approved by

Noel D. Daur

Date

09/25/2018

Upper Columbia River Northern Pike Sampling  
(LAB COPY)

Date Shipped: 7/27/2018

Contact Name: Kelly O'Neal

Contact Phone: 812-371-7476

## CHAIN OF CUSTODY RECORD

Project Code: SFP-139A

Cooler #: 4

No: 10-072718-124159-0004

Lab: ALS Laboratory Group - Kelso

Carrier Name: Spokane Courier Delivery

Airbill No: Hand Delivery

K1807189  
K1807148

| Sample Identifier | CLP Sample No. | Matrix/Sampler   | Coll. Method | Analysis/Turnaround (Days) | Tag/Preservative/Bottles | Location     | Collection Date/Time | For Lab Use Only |
|-------------------|----------------|------------------|--------------|----------------------------|--------------------------|--------------|----------------------|------------------|
| EPA-NP-B-001      | 18304630       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 31 (0C) (1)              | EPA-NP-B-001 | 07/24/2018 11:20     |                  |
| EPA-NP-B-002      | 18304631       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 32 (0C) (1)              | EPA-NP-B-002 | 07/24/2018 11:39     |                  |
| EPA-NP-B-003      | 18304632       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 33 (0C) (1)              | EPA-NP-B-003 | 07/24/2018 12:15     |                  |
| EPA-NP-B-004      | 18304633       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 34 (0C) (1)              | EPA-NP-B-004 | 07/24/2018 13:00     |                  |
| EPA-NP-B-005      | 18304634       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 35 (0C) (1)              | EPA-NP-B-005 | 07/24/2018 14:20     |                  |
| EPA-NP-B-006      | 18304635       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 36 (0C) (1)              | EPA-NP-B-006 | 07/24/2018 14:38     |                  |
| EPA-NP-B-007      | 18304636       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 37 (0C) (1)              | EPA-NP-B-007 | 07/24/2018 15:14     |                  |
| EPA-NP-B-008      | 18304637       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 38 (0C) (1)              | EPA-NP-B-008 | 07/24/2018 15:49     |                  |
| EPA-NP-B-009      | 18304638       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 39 (0C) (1)              | EPA-NP-B-009 | 07/24/2018 16:00     |                  |
| EPA-NP-B-010      | 18304639       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 40 (0C) (1)              | EPA-NP-B-010 | 07/24/2018 16:13     |                  |

## Special Instructions:

TAL Metals: EPA Method 6010C

Inorganic Arsenic: EPA Method 1632A

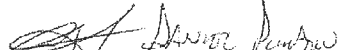
Percent Lipids

Percent Moisture

Shipment for Case Complete? N

Samples Transferred From Chain of Custody #

Analysis Key: MultiAnalyte=Refer to Special Instructions

| Items/Reason | Relinquished by (Signature and Organization)                                        | Date/Time          | Received by (Signature and Organization)                                                      | Date/Time       | Sample Condition Upon Receipt |
|--------------|-------------------------------------------------------------------------------------|--------------------|-----------------------------------------------------------------------------------------------|-----------------|-------------------------------|
|              |  | 7/27/2018<br>14:00 | <br>ALS-K | 7-28-18<br>1245 |                               |

Upper Columbia River Northern Pike Sampling  
(LAB COPY)

Date Shipped: 7/27/2018

Contact Name: Kelly O'Neal

Contact Phone: 812-371-7476

## CHAIN OF CUSTODY RECORD

Project Code: SFP-139A

Cooler #: *AS* 

No: 10-072718-124346-0005

Lab: ALS Laboratory Group - Kelso

Carrier Name: Spokane Courier Delivery

Airbill No: Hand Delivery

| Sample Identifier | CLP Sample No. | Matrix/Sampler   | Coll. Method | Analysis/Turnaround (Days) | Tag/Preservative/Bottles | Location     | Collection Date/Time | For Lab Use Only |
|-------------------|----------------|------------------|--------------|----------------------------|--------------------------|--------------|----------------------|------------------|
| EPA-NP-B-011      | 18304640       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 41 (OC) (1)              | EPA-NP-B-011 | 07/24/2018 16:26     |                  |
| EPA-NP-B-012      | 18304641       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 42 (OC) (1)              | EPA-NP-B-012 | 07/25/2018 10:01     |                  |
| EPA-NP-B-013      | 18304642       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 43 (OC) (1)              | EPA-NP-B-013 | 07/25/2018 12:24     |                  |
| EPA-NP-B-014      | 18304643       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 44 (OC) (1)              | EPA-NP-B-014 | 07/25/2018 13:20     |                  |
| EPA-NP-B-015      | 18304644       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 45 (OC) (1)              | EPA-NP-B-015 | 07/25/2018 14:35     |                  |
| EPA-NP-B-016      | 18304645       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 46 (OC) (1)              | EPA-NP-B-016 | 07/25/2018 14:50     |                  |
| EPA-NP-B-017      | 18304646       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 47 (OC) (1)              | EPA-NP-B-017 | 07/25/2018 15:19     |                  |
| EPA-NP-B-018      | 18304647       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 48 (OC) (1)              | EPA-NP-B-018 | 07/25/2018 15:32     |                  |
| EPA-NP-B-019      | 18304648       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 49 (OC) (1)              | EPA-NP-B-019 | 07/25/2018 15:56     |                  |
| EPA-NP-B-020      | 18304649       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 50 (OC) (1)              | EPA-NP-B-020 | 07/25/2018 16:16     |                  |

## Special Instructions:

TAL Metals: EPA Method 6010C

Inorganic Arsenic: EPA Method 1632A

Percent Lipids

Percent Moisture

Shipment for Case Complete? N

Samples Transferred From Chain of Custody #

Analysis Key: MultiAnalyte=Refer to Special Instructions

| Items/Reason | Relinquished by (Signature and Organization) | Date/Time          | Received by (Signature and Organization) | Date/Time         | Sample Condition Upon Receipt |
|--------------|----------------------------------------------|--------------------|------------------------------------------|-------------------|-------------------------------|
|              | <i>Kelly O'Neal</i>                          | 7/27/2018<br>14:00 | <i>[Signature]</i><br>ALS-K              | 7/28/2018<br>1245 | SAT                           |



K180 7187  
~~K180 7146~~  
 ASD K-104

Page 1 of 1

Upper Columbia River Northern Pike Sampling  
 (LAB COPY)

DateShipped: 7/27/2018

Contact Name: Kelly O'Neal

Contact Phone: 812-371-7476

CHAIN OF CUSTODY RECORD

Project Code: SFP-139A

Cooler #: 6

No: 10-072718-124621-0006

Lab: ALS Laboratory Group - Kelso

CarrierName: Spokane Courier Delivery

AirbillNo: Hand Delivery

| Sample Identifier | CLP Sample No. | Matrix/Sampler   | Coll. Method | Analysis/Turnaround (Days) | Tag/Preservative/Bottles | Location     | Collection Date/Time | For Lab Use Only |
|-------------------|----------------|------------------|--------------|----------------------------|--------------------------|--------------|----------------------|------------------|
| EPA-NP-B-021      | 18304650       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 51 (0C) (1)              | EPA-NP-B-021 | 07/25/2018 16:30     |                  |
| EPA-NP-B-022      | 18304651       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 52 (0C) (1)              | EPA-NP-B-022 | 07/26/2018 09:26     |                  |
| EPA-NP-B-023      | 18304652       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 53 (0C) (1)              | EPA-NP-B-023 | 07/26/2018 09:40     |                  |
| EPA-NP-B-024      | 18304653       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 54 (0C) (1)              | EPA-NP-B-024 | 07/26/2018 12:50     |                  |
| EPA-NP-B-025      | 18304654       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 55 (0C) (1)              | EPA-NP-B-025 | 07/26/2018 13:18     |                  |
| EPA-NP-B-026      | 18304655       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 56 (0C) (1)              | EPA-NP-B-026 | 07/26/2018 14:13     |                  |
| EPA-NP-B-027      | 18304656       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 57 (0C) (1)              | EPA-NP-B-027 | 07/26/2018 14:28     |                  |
| EPA-NP-B-028      | 18304657       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 58 (0C) (1)              | EPA-NP-B-028 | 07/26/2018 14:43     |                  |
| EPA-NP-B-029      | 18304658       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 59 (0C) (1)              | EPA-NP-B-029 | 07/26/2018 15:06     |                  |
| EPA-NP-B-030      | 18304659       | Tissue/ KLO, JSY | Gill Netting | MultiAnalyte               | 60 (0C) (1)              | EPA-NP-B-030 | 07/26/2018 15:21     |                  |

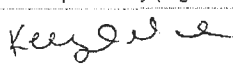
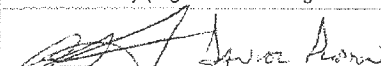
Special Instructions:

TAL Metals: EPA Method 6010C  
 Inorganic Arsenic: EPA Method 1632A  
 Percent Lipids  
 Percent Moisture

Shipment for Case Complete? N

Samples Transferred From Chain of Custody #

Analysis Key: MultiAnalyte=Refer to Special Instructions

| Items/Reason | Relinquished by (Signature and Organization)                                        | Date/Time          | Received by (Signature and Organization)                                                      | Date/Time       | Sample Condition Upon Receipt |
|--------------|-------------------------------------------------------------------------------------|--------------------|-----------------------------------------------------------------------------------------------|-----------------|-------------------------------|
|              |  | 7/27/2018<br>14:00 | <br>ALS-K | 7-28-18<br>1245 |                               |



TEK

## Cooler Receipt and Preservation Form

K1807189

PC MH

Client Upper Columbia River Northwest Pice Sampling Service Request K18-07148  
 Received: 7-31-18 Opened: 7-31-18 By: ASP Unloaded: 7-31-18 By: ASP

1. Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered  
 2. Samples were received in: (circle) Cooler Box Envelope Other NA  
 3. Were custody seals on coolers? NA Y N If yes, how many and where? 2 Top Front & Back  
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N

| Raw Cooler Temp | Corrected Cooler Temp | Raw Temp Blank | Corrected Temp Blank | Corr. Factor | Thermometer ID | Cooler/COC ID | Tracking Number | NA | Filed |
|-----------------|-----------------------|----------------|----------------------|--------------|----------------|---------------|-----------------|----|-------|
| -50.0           | -50.2                 | N/A            | N/A                  | -0.2         | 370            | NA            |                 | NA |       |
| -45.7           | -45.7                 | Frozen         | Frozen               | 0.0          | 300            |               |                 |    |       |
| -30.8           | -30.9                 | Frozen         | Frozen               | -0.1         | 308            |               |                 |    |       |
| -50.0           | -50.1                 | Frozen         | Frozen               | -0.1         | 371            |               |                 |    |       |
| -48.1           | -48.1                 | N/A            | N/A                  | 0.0          | 386            |               |                 |    |       |

4. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves  
 5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N  
 6. Were samples received in good condition (temperature, unbroken)? Indicate in the table below. NA Y N  
 If applicable, tissue samples were received: Frozen Partially Thawed Thawed  
 7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N  
 8. Did all sample labels and tags agree with custody papers? Indicate major discrepancies in the table on page 2. NA Y N  
 9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N  
 10. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA Y N  
 11. Were VOA vials received without headspace? Indicate in the table below. NA Y N  
 12. Was C12/Res negative? NA Y N

| Sample ID on Bottle | Sample ID on COC | Identified by: |
|---------------------|------------------|----------------|
|                     |                  |                |
|                     |                  |                |
|                     |                  |                |

| Sample ID | Bottle Count<br>Bottle Type | Out of<br>Temp | Head-<br>space | Broke | pH | Reagent | Volume<br>added | Reagent Lot<br>Number | Initials | Time |
|-----------|-----------------------------|----------------|----------------|-------|----|---------|-----------------|-----------------------|----------|------|
|           |                             |                |                |       |    |         |                 |                       |          |      |
|           |                             |                |                |       |    |         |                 |                       |          |      |
|           |                             |                |                |       |    |         |                 |                       |          |      |
|           |                             |                |                |       |    |         |                 |                       |          |      |
|           |                             |                |                |       |    |         |                 |                       |          |      |
|           |                             |                |                |       |    |         |                 |                       |          |      |

## Notes, Discrepancies, &amp; Resolutions:

SAMPLES RECEIVED SATURDAY, 7-28-18. SAMPLES WERE FROZEN ON DRY ICE  
AND IMMEDIATELY STORED IN FREEZER.



# Cooler Receipt and Preservation Form

K180787

PC MH

Client TECK Service Request K18  
Received: 7-31-18 Opened: 7-31-18 By: ASP Unloaded: 7-31-18 By: ASP

1. Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered  
2. Samples were received in: (circle) Cooler Box Envelope Other NA  
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2 TOP FRONT & BACK  
If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

| Raw Cooler Temp | Corrected Cooler Temp | Raw Temp Blank | Corrected Temp Blank | Corr. Factor | Thermometer ID | Cooler/COC ID | Tracking Number | Filed |
|-----------------|-----------------------|----------------|----------------------|--------------|----------------|---------------|-----------------|-------|
| -48.0           | -47.9                 | Frozen         | Frozen               | 10.1         | 391            | NA            | NA              |       |
|                 |                       |                |                      |              |                |               |                 |       |
|                 |                       |                |                      |              |                |               |                 |       |
|                 |                       |                |                      |              |                |               |                 |       |
|                 |                       |                |                      |              |                |               |                 |       |

4. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves  
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N  
6. Were samples received in good condition (temperature, unbroken)? Indicate in the table below. NA (Y) N  
If applicable, tissue samples were received: Frozen Partially Thawed Thawed  
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N  
8. Did all sample labels and tags agree with custody papers? Indicate major discrepancies in the table on page 2. NA (Y) N  
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N  
10. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA Y N  
11. Were VOA vials received without headspace? Indicate in the table below. NA Y N  
12. Was C12/Res negative? NA Y N

| Sample ID on Bottle | Sample ID on COC | Identified by: |
|---------------------|------------------|----------------|
|                     |                  |                |
|                     |                  |                |
|                     |                  |                |

| Sample ID | Bottle Count | Bottle Type | Out of Temp | Head-space | Broke | pH | Reagent | Volume added | Reagent Lot Number | Initials | Time |
|-----------|--------------|-------------|-------------|------------|-------|----|---------|--------------|--------------------|----------|------|
|           |              |             |             |            |       |    |         |              |                    |          |      |
|           |              |             |             |            |       |    |         |              |                    |          |      |
|           |              |             |             |            |       |    |         |              |                    |          |      |
|           |              |             |             |            |       |    |         |              |                    |          |      |
|           |              |             |             |            |       |    |         |              |                    |          |      |

Notes, Discrepancies, & Resolutions: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

K1807187

| Size Group B            |       |              |             |            |                   |           | Composite     |
|-------------------------|-------|--------------|-------------|------------|-------------------|-----------|---------------|
| Date                    | Time  | ID           | Length (mm) | Weight (g) | Fillet Weight (g) |           |               |
| <sup>1</sup> 24-Jul-18  | 14:38 | EPA-NP-B-006 | 455         | 690        | 165               | EPA-NP-B1 | <sup>6</sup>  |
| <sup>2</sup> 25-Jul-18  | 12:24 | EPA-NP-B-013 | 465         | 755        | 175               | EPA-NP-B1 |               |
| <sup>3</sup> 26-Jul-18  | 9:40  | EPA-NP-B-023 | 465         | 670        | 145               | EPA-NP-B1 |               |
| <sup>4</sup> 26-Jul-18  | 15:21 | EPA-NP-B-030 | 505         | 775        | 130               | EPA-NP-B1 |               |
| <sup>5</sup> 26-Jul-18  | 14:28 | EPA-NP-B-027 | 660         | 1890       | 350               | EPA-NP-B1 |               |
| <sup>7</sup> 25-Jul-18  | 10:01 | EPA-NP-B-012 | 450         | 490        | 125               | EPA-NP-B2 | <sup>12</sup> |
| <sup>8</sup> 26-Jul-18  | 14:13 | EPA-NP-B-026 | 460         | 660        | 110               | EPA-NP-B2 |               |
| <sup>9</sup> 25-Jul-18  | 14:35 | EPA-NP-B-015 | 500         | 835        | 140               | EPA-NP-B2 |               |
| <sup>10</sup> 25-Jul-18 | 14:50 | EPA-NP-B-016 | 500         | 835        | 210               | EPA-NP-B2 |               |
| <sup>11</sup> 24-Jul-18 | 15:14 | EPA-NP-B-007 | 700         | 2540       | 890               | EPA-NP-B2 |               |
| <sup>12</sup> 24-Jul-18 | 15:49 | EPA-NP-B-008 | 455         | 635        | 135               | EPA-NP-B3 | <sup>18</sup> |
| <sup>13</sup> 25-Jul-18 | 15:32 | EPA-NP-B-018 | 460         | 545        | 115               | EPA-NP-B3 |               |
| <sup>14</sup> 25-Jul-18 | 16:30 | EPA-NP-B-021 | 495         | 890        | 180               | EPA-NP-B3 |               |
| <sup>15</sup> 24-Jul-18 | 11:20 | EPA-NP-B-001 | 660         | 2275       | 400               | EPA-NP-B3 |               |
| <sup>16</sup> 24-Jul-18 | 16:13 | EPA-NP-B-010 | 750         | 3210       | 620               | EPA-NP-B3 |               |
| <sup>17</sup> 25-Jul-18 | 16:16 | EPA-NP-B-020 | 455         | 700        | 150               | EPA-NP-B4 | <sup>24</sup> |
| <sup>18</sup> 24-Jul-18 | 13:00 | EPA-NP-B-004 | 460         | 645        | 160               | EPA-NP-B4 |               |
| <sup>19</sup> 26-Jul-18 | 14:43 | EPA-NP-B-028 | 465         | 650        | 150               | EPA-NP-B4 |               |
| <sup>20</sup> 26-Jul-18 | 15:06 | EPA-NP-B-029 | 615         | 1560       | 285               | EPA-NP-B4 |               |
| <sup>21</sup> 25-Jul-18 | 13:20 | EPA-NP-B-014 | 710         | 2340       | 490               | EPA-NP-B4 |               |
| <sup>22</sup> 24-Jul-18 | 14:20 | EPA-NP-B-005 | 455         | 630        | 165               | EPA-NP-B5 | <sup>30</sup> |
| <sup>23</sup> 24-Jul-18 | 11:39 | EPA-NP-B-002 | 460         | 655        | 180               | EPA-NP-B5 |               |
| <sup>24</sup> 26-Jul-18 | 12:50 | EPA-NP-B-024 | 475         | 715        | 125               | EPA-NP-B5 |               |
| <sup>25</sup> 26-Jul-18 | 13:18 | EPA-NP-B-025 | 525         | 1015       | 220               | EPA-NP-B5 |               |
| <sup>26</sup> 24-Jul-18 | 16:26 | EPA-NP-B-011 | 710         | 2445       | 460               | EPA-NP-B5 |               |
| <sup>27</sup> 25-Jul-18 | 15:56 | EPA-NP-B-019 | 450         | 590        | 195               | EPA-NP-B6 | <sup>36</sup> |
| <sup>28</sup> 24-Jul-18 | 16:00 | EPA-NP-B-009 | 465         | 705        | 180               | EPA-NP-B6 |               |
| <sup>29</sup> 25-Jul-18 | 15:19 | EPA-NP-B-017 | 480         | 730        | 165               | EPA-NP-B6 |               |
| <sup>30</sup> 26-Jul-18 | 9:26  | EPA-NP-B-022 | 500         | 890        | 165               | EPA-NP-B6 |               |
| <sup>31</sup> 24-Jul-18 | 12:15 | EPA-NP-B-003 | 1070        | 7830       | 1130              | EPA-NP-B6 |               |

## Service Request Summary

**Folder #:** K1807189  
**Client Name:** Teck American Incorporated  
**Project Name:** 2018 Northern Pike Tissue Study  
**Project Number:** SFP-139A  
**P.O. Number:**

**Report To:** Cristy Kessel  
 Teck American Incorporated  
 501 North Riverpoint Blvd., Suite 300  
 Spokane, WA 99202

**Phone Number:** 509-623-4530  
**Cell Number:** 509-496-1160  
**Fax Number:**  
**E-mail:** cristy.kessel@teck.com

**Project Chemist:** Mark Harris  
**Logged By:** DPLIMPTON  
**Date Received:** 7/28/18  
**Time Received:** 1245  
**Archive?** N

**Folder Due Date:** 8/29/18  
**Internal Due Date:** 8/23/18  
**QAP:** LAB QAP  
**Qualifier Set:** Lab Standard  
**Formset:** Lab Standard

**Report to MDL?:** Y  
**Merged?:** Y **Batch QC?:** N  
**PC Approved?:** N

**State of Sampling Location:** WA  
**EDD:** No EDD Specified

36 - 1 Gal-Plastic Bag Ziplock - Gallon Unpreserved

**Location:** SMO, TISSUE 47 (SMO)

| Lab Samp No. | Client Samp No. | Matrix      | Collected | Metals              |                  |                 |                 |            |                                            |                         |                  |                     |                     | SVG            |                          | SMO                    |  |
|--------------|-----------------|-------------|-----------|---------------------|------------------|-----------------|-----------------|------------|--------------------------------------------|-------------------------|------------------|---------------------|---------------------|----------------|--------------------------|------------------------|--|
|              |                 |             |           | 1631app/ Hg LL<br>T | 1632/ As Inorg T | 6010C/ Metals T | 6020A/ Metals T | 7742/ Se T | Calculation/<br>Moisture<br>Calc_FreezeDry | Composite/<br>Composite | Frz Dry/ Frz Dry | Homogen/<br>Homogen | None/<br>MISC_MET I | Lipids/ LIPIDS | Archive/ Archive<br>-20C | Archive/ Archive<br>RT |  |
| K1807189-001 | EPA-NP-B-006    | Fish Tissue | 7/24/18   | 1438                |                  |                 |                 |            |                                            |                         | IV               |                     |                     |                | IV                       |                        |  |
| K1807189-002 | EPA-NP-B-013    | Fish Tissue | 7/25/18   | 1224                |                  |                 |                 |            |                                            |                         | IV               |                     |                     |                | IV                       |                        |  |
| K1807189-003 | EPA-NP-B-023    | Fish Tissue | 7/26/18   | 0940                |                  |                 |                 |            |                                            |                         | IV               |                     |                     |                | IV                       |                        |  |
| K1807189-004 | EPA-NP-B-030    | Fish Tissue | 7/26/18   | 1521                |                  |                 |                 |            |                                            |                         | IV               |                     |                     |                | IV                       |                        |  |
| K1807189-005 | EPA-NP-B-027    | Fish Tissue | 7/26/18   | 1428                |                  |                 |                 |            |                                            |                         | IV               |                     |                     |                | IV                       |                        |  |
| K1807189-006 | EPA-NP-B1       | Fish Tissue | 7/26/18   |                     | IV               | IV              | IV              | IV         | IV                                         | IV                      |                  | IV                  | IV                  | IV(C)          | IV                       | IV                     |  |
| K1807189-007 | EPA-NP-B-012    | Fish Tissue | 7/25/18   | 1001                |                  |                 |                 |            |                                            |                         | IV               |                     |                     |                | IV                       |                        |  |
| K1807189-008 | EPA-NP-B-026    | Fish Tissue | 7/26/18   | 1413                |                  |                 |                 |            |                                            |                         | IV               |                     |                     |                | IV                       |                        |  |
| K1807189-009 | EPA-NP-B-015    | Fish Tissue | 7/25/18   | 1435                |                  |                 |                 |            |                                            |                         | IV               |                     |                     |                | IV                       |                        |  |
| K1807189-010 | EPA-NP-B-016    | Fish Tissue | 7/25/18   | 1450                |                  |                 |                 |            |                                            |                         | IV               |                     |                     |                | IV                       |                        |  |
| K1807189-011 | EPA-NP-B-007    | Fish Tissue | 7/24/18   | 1514                |                  |                 |                 |            |                                            |                         | IV               |                     |                     |                | IV                       |                        |  |
| K1807189-012 | EPA-NP-B2       | Fish Tissue | 7/26/18   |                     | IV               | IV              | IV              | IV         | IV                                         |                         |                  | IV                  | IV                  | IV(C)          | IV                       | IV                     |  |
| K1807189-013 | EPA-NP-B-008    | Fish Tissue | 7/24/18   | 1549                |                  |                 |                 |            |                                            |                         | IV               |                     |                     |                | IV                       |                        |  |
| K1807189-014 | EPA-NP-B-018    | Fish Tissue | 7/25/18   | 1532                |                  |                 |                 |            |                                            |                         | IV               |                     |                     |                | IV                       |                        |  |
| K1807189-015 | EPA-NP-B-021    | Fish Tissuc | 7/25/18   | 1630                |                  |                 |                 |            |                                            |                         | IV               |                     |                     |                | IV                       |                        |  |
| K1807189-016 | EPA-NP-B-001    | Fish Tissue | 7/24/18   | 1120                |                  |                 |                 |            |                                            |                         | IV               |                     |                     |                | IV                       |                        |  |
| K1807189-017 | EPA-NP-B-010    | Fish Tissue | 7/24/18   | 1613                |                  |                 |                 |            |                                            |                         | IV               |                     |                     |                | IV                       |                        |  |
| K1807189-018 | EPA-NP-B3       | Fish Tissue | 7/25/18   |                     | IV               | IV              | IV              | IV         | IV                                         |                         |                  | IV                  | IV                  | IV(C)          | IV                       | IV                     |  |
| K1807189-019 | EPA-NP-B-020    | Fish Tissue | 7/25/18   | 1616                |                  |                 |                 |            |                                            |                         | IV               |                     |                     |                | IV                       |                        |  |
| K1807189-020 | EPA-NP-B-004    | Fish Tissue | 7/24/18   | 1300                |                  |                 |                 |            |                                            |                         | IV               |                     |                     |                | IV                       |                        |  |

## Service Request Summary

**Folder #:** K1807189  
**Client Name:** Teck American Incorporated  
**Project Name:** 2018 Northern Pike Tissue Study  
**Project Number:** SFP-139A  
**P.O. Number:**

**Report To:** Cristy Kessel  
 Teck American Incorporated  
 501 North Riverpoint Blvd., Suite 300  
 Spokane, WA 99202

**Phone Number:** 509-623-4530  
**Cell Number:** 509-496-1160  
**Fax Number:**  
**E-mail:** cristy.kessel@teck.com

**Project Chemist:** Mark Harris  
**Logged By:** DPLIMPTON  
**Date Received:** 7/28/18  
**Time Received:** 1245  
**Archive?** N  
**Folder Due Date:** 8/29/18  
**Internal Due Date:** 8/23/18  
**QAP:** LAB QAP  
**Qualifier Set:** Lab Standard  
**Formset:** Lab Standard  
**Report to MDL?:** Y  
**Merged?:** Y **Batch QC?:** N  
**PC Approved?:** N  
**State of Sampling Location:** WA  
**EDD:** No EDD Specified

36 - 1 Gal-Plastic Bag Ziplock - Gallon Unpreserved

**Location:** SMO, TISSUE 47 (SMO)

|              |              |             |         | Metals              |                  |                 |                 |            |                                             |                         |                  |                     |                    | SVG            | SMO                      |                        |
|--------------|--------------|-------------|---------|---------------------|------------------|-----------------|-----------------|------------|---------------------------------------------|-------------------------|------------------|---------------------|--------------------|----------------|--------------------------|------------------------|
|              |              |             |         | 1631app/ Hg LL<br>T | 1632/ As Inorg T | 6010C/ Metals T | 6020A/ Metals T | 7742/ Se T | Calculation/<br>Moisture<br>Calc. FreezeDry | Composite/<br>Composite | Frz Dry/ Frz Dry | Homogen/<br>Homogen | None/<br>MISC_MET1 | Lipids/ LIPIDS | Archive/ Archive<br>-20C | Archive/ Archive<br>RT |
| K1807189-021 | EPA-NP-B-028 | Fish Tissue | 7/26/18 | 1443                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807189-022 | EPA-NP-B-029 | Fish Tissue | 7/26/18 | 1506                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807189-023 | EPA-NP-B-014 | Fish Tissue | 7/25/18 | 1320                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807189-024 | EPA-NP-B4    | Fish Tissue | 7/26/18 |                     | IV               | IV              | IV              | IV         | IV                                          |                         | IV               | IV                  | IV(C)              | IV             | IV(C)                    | IV                     |
| K1807189-025 | EPA-NP-B-005 | Fish Tissue | 7/24/18 | 1420                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807189-026 | EPA-NP-B-002 | Fish Tissue | 7/24/18 | 1139                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807189-027 | EPA-NP-B-024 | Fish Tissue | 7/26/18 | 1250                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807189-028 | EPA-NP-B-025 | Fish Tissue | 7/26/18 | 1318                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807189-029 | EPA-NP-B-011 | Fish Tissue | 7/24/18 | 1626                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807189-030 | EPA-NP-B5    | Fish Tissue | 7/26/18 |                     | IV               | IV              | IV              | IV         | IV                                          |                         | IV               | IV                  | IV(C)              | IV             | IV(C)                    | IV                     |
| K1807189-031 | EPA-NP-B-019 | Fish Tissue | 7/25/18 | 1556                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807189-032 | EPA-NP-B-009 | Fish Tissue | 7/24/18 | 1600                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807189-033 | EPA-NP-B-017 | Fish Tissue | 7/25/18 | 1519                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807189-034 | EPA-NP-B-022 | Fish Tissue | 7/26/18 | 0926                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807189-035 | EPA-NP-B-003 | Fish Tissue | 7/24/18 | 1215                |                  |                 |                 |            |                                             | IV                      |                  |                     |                    |                | IV                       |                        |
| K1807189-036 | EPA-NP-B6    | Fish Tissue | 7/26/18 |                     | IV               | IV              | IV              | IV         | IV                                          |                         | IV               | IV                  | IV(C)              | IV             | IV(C)                    | IV                     |

**Folder Comments:**

## Service Request Summary

**Folder #:** K1807189  
**Client Name:** Teck American Incorporated  
**Project Name:** 2018 Northern Pike Tissue Study  
**Project Number:** SFP-139A  
**P.O. Number:**

**Report To:** Cristy Kessel  
 Teck American Incorporated  
 501 North Riverpoint Blvd., Suite 300  
 Spokane, WA 99202  
**Phone Number:** 509-623-4530  
**Cell Number:** 509-496-1160  
**Fax Number:**  
**E-mail:** cristy.kessel@teck.com

**Project Chemist:** Mark Harris  
**Logged By:** DPLIMPTON  
**Date Received:** 7/28/18  
**Time Received:** 1245  
**Archive?** N  
**Folder Due Date:** 8/29/18  
**Internal Due Date:** 8/23/18  
**QAP:** LAB QAP  
**Qualifier Set:** Lab Standard  
**Formset:** Lab Standard  
**Report to MDL?:** Y  
**Merged?:** Y **Batch QC?:** N  
**PC Approved?:** N  
**State of Sampling Location:** WA  
**EDD:** No EDD Specified

36 - 1 Gal-Plastic Bag Ziplock - Gallon Unpreserved

**Location:** SMO, TISSUE 47 (SMO)

**Composite Instructions:** Skin off. Both fillets w/ belly flap. Homogenize fillets individually. Use equal portions by mass for the composites. Archive leftover frozen. Use the new blender with titanium blades.

**MS/MSD/SRM and a triplicate per 20 required if ample mass. Choose QC samples.**

### Test Comments:

| Group  | Test/Method          | Samples                               | Comments                                              |
|--------|----------------------|---------------------------------------|-------------------------------------------------------|
| Metals | As Inorg T/1632      | 6, 12, 18, 24, 30, 36                 | Inorg-As                                              |
| Metals | Composite/Composite  | 1-5, 7-11, 13-17, 19-23, 25-29, 31-35 | Composite 5 tissue samples into 1 sample for analysis |
| Metals | Hg LL T/1631app      | 6, 12, 18, 24, 30, 36                 | Hg                                                    |
| Metals | Metals T/6010C       | 6, 12, 18, 24, 30, 36                 | Al,Ca,Fe,Mg,K,S,Na                                    |
| Metals | Metals T/6020A       | 6, 12, 18, 24, 30, 36                 | Sb,As,Ba,Be,Cd,Cr,Co,Cu,Pb,Mn,Ni,Se,Ag,T,I,U,V,Zn     |
| SMO    | Archive -20C/Archive | 1-5, 7-11, 13-17, 19-23, 25-29, 31-35 | Per month.                                            |
| SMO    | Archive RT/Archive   | 6, 12, 18, 24, 30, 36                 | Per month.                                            |

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| Test/Method    | Samples               | Elements                                                                                                                                                              |
|----------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6010C/Metals T | 6, 12, 18, 24, 30, 36 | Aluminum / Calcium / Iron / Magnesium / Potassium / Sodium / Sulfur                                                                                                   |
| 6020A/Metals T | 6, 12, 18, 24, 30, 36 | Antimony / Arsenic / Barium / Beryllium / Cadmium / Chromium / Cobalt / Copper / Lead / Manganese / Nickel / Selenium / Silver / Thallium / Uranium / Vanadium / Zinc |
| None/MISC_MET1 | 6, 12, 18, 24, 30, 36 | Unknown                                                                                                                                                               |



Client: Teck American Incorporated  
Project: Liquid/2018 Northern Pike Tissue Study  
Sample Matrix: Water

Service Request: K1807597  
Date Received: 08/10/2018 - 08/24/2018  
3

#### CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV validation deliverables including summary forms and all of the associated raw data for each of the analyses. When appropriate to the method, method blank results have been reported with each analytical test.

#### Sample Receipt:

3

Nineteen water samples were created for analysis at ALS Environmental between 08/10/2018 - 08/24/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

#### Metals:

No significant anomalies were noted with this analysis.

Lab-generated blanks

no COC

RTW  
9/26/18

Approved by

Noel D. Davis

Date

09/12/2018





## Confirmation of Sample Receipt

|               |                        |               |                           |
|---------------|------------------------|---------------|---------------------------|
| <b>To:</b>    | Cristy Kessel          | <b>From:</b>  | Mark Harris               |
| <b>Email:</b> | cristy.kessel@teck.com | <b>Email:</b> | Mark.Harris@alsglobal.com |
| <b>Fax:</b>   |                        | <b>Fax:</b>   | 360-636-1068              |
| <b>Phone:</b> | 509-623-4530           | <b>Phone:</b> | 360-577-7222 x3376        |

Samples for analysis have been received by ALS Environmental on 8/10 - 24/18 and assigned our Service Request number **K1807597**. **Please verify the following information and notify me of any corrections as soon as possible.**

The estimated completion date for this work is: 9/10/18

**Client:** Teck American Incorporated  
**Project:** Liquid/2018 Northern Pike Tissue Study/Blanks

**EDD Required:** Yes

**Tier:** IV

**Report To:** Cristy Kessel  
Teck American Incorporated  
501 North Riverpoint Blvd., Suite 300  
Spokane, WA 99202

**Billing Address:** Cristy Kessel  
Teck American Incorporated  
501 North Riverpoint Blvd., Suite 300  
Spokane, WA 99202

**Comments:**

**Thank you for your business!**

A - Test is Authorized

H - Test is On Hold

HP - Test is On Hold  
Pending InputP - Test is Authorized for  
Prep Only

C - Test has been Cancelled ✓

\* - Test has assigned QC

|              |                                            |       |              | 1631E<br>Hg LL T | 1632<br>As Inorg T | 6010C<br>Metals T | 6020A<br>Metals T | 7742<br>Se T |   |
|--------------|--------------------------------------------|-------|--------------|------------------|--------------------|-------------------|-------------------|--------------|---|
| K1807597-001 | Rinsate Blank                              | Water | 8/6/18       | C                | C                  | C                 | C                 | C            | X |
| K1807597-002 | Rinsate Blank-Northern Pike<br>8/14        | Water | 8/14/18 1205 | A                | A                  | A                 | A                 | A            |   |
| K1807597-003 | Homogenization<br>Blank-Northern Pike 8/14 | Water | 8/14/18 1304 | A                | A                  | A                 | A                 | A            |   |
| K1807597-004 | Homogenization<br>Blank-Northern Pike 8/14 | Water | 8/14/18 1353 | A                | A                  | A                 | A                 | A            |   |
| K1807597-005 | Rinsate Blank-Northern Pike<br>8/15        | Water | 8/15/18 1052 | A                | A                  | A                 | A                 | A            |   |
| K1807597-006 | Homogenization<br>Blank-Northern Pike 8/15 | Water | 8/15/18 1315 | A                | A                  | A                 | A                 | A            |   |
| K1807597-007 | Homogenization<br>Blank-Northern Pike 8/15 | Water | 8/15/18 1420 | A                | A                  | A                 | A                 | A            |   |
| K1807597-008 | Rinsate Blank-Northern Pike<br>8/17        | Water | 8/17/18 0851 | A                | A                  | A                 | A                 | A            |   |
| K1807597-009 | Homogenization<br>Blank-Northern Pike 8/17 | Water | 8/17/18 0954 | A                | A                  | A                 | A                 | A            |   |
| K1807597-010 | Homogenization<br>Blank-Northern Pike 8/17 | Water | 8/17/18 1245 | A                | A                  | A                 | A                 | A            |   |
| K1807597-011 | Rinsate Blank-Northern Pike<br>8/21        | Water | 8/21/18 0915 | A                | A                  | A                 | A                 | A            |   |
| K1807597-012 | Homogenization<br>Blank-Northern Pike 8/21 | Water | 8/21/18 1037 | A                | A                  | A                 | A                 | A            |   |
| K1807597-013 | Homogenization<br>Blank-Northern Pike 8/21 | Water | 8/21/18 1313 | A                | A                  | A                 | A                 | A            |   |
| K1807597-014 | Rinsate Blank-Northern Pike<br>8/22        | Water | 8/22/18 0953 | A                | A                  | A                 | A                 | A            |   |

|              |                                            |       |              | 1631E<br>Hg LL T | 1632<br>As Inorg T | 6010C<br>Metals T | 6020A<br>Metals T | 7742<br>Se T |
|--------------|--------------------------------------------|-------|--------------|------------------|--------------------|-------------------|-------------------|--------------|
| K1807597-015 | Homogenization<br>Blank-Northern Pike 8/22 | Water | 8/22/18 1238 | A                | A                  | A                 | A                 | A            |
| K1807597-016 | Homogenization<br>Blank-Northern Pike 8/22 | Water | 8/22/18 1355 | A                | A                  | A                 | A                 | A            |
| K1807597-017 | Rinsate Blank-Northern Pike<br>8/24        | Water | 8/24/18 0855 | A                | A                  | A                 | A                 | A            |
| K1807597-018 | Homogenization<br>Blank-Northern Pike 8/24 | Water | 8/24/18 1145 | A                | A                  | A                 | A                 | A            |
| K1807597-019 | Homogenization<br>Blank-Northern Pike 8/24 | Water | 8/24/18 1300 | A                | A                  | A                 | A                 | A            |

Samples -020, -021, -022 taken off Hold and analyzed as well

TWW  
10/9/18

#### Test Comments:

| Group  | Test/Method     | Samples                            | Comments                                      |
|--------|-----------------|------------------------------------|-----------------------------------------------|
| Metals | 1632/As Inorg T | 1-19                               | As by 1632                                    |
| Metals | 6010C/Metals T  | 1-19                               | Al,Ca,Fe,Mg,K,S,Na                            |
| Metals | 6020A/Metals T  | 1-2, R01, 3-4, R01, 5-6, R01, 7-19 | Sb,As,Ba,Bc,Cd,Cr,Co,Cu,Pb,Mn,Ni,Ag,Tl,U,V,Zn |

Se by 7742

## **SECTION 5**

### **PROJECT CORRESPONDENCE**

## Tom Weinmann

---

**From:** Kessel Cristy SPOK <Cristy.Kessel@teck.com>  
**Sent:** Monday, September 24, 2018 3:26 PM  
**To:** Tom Weinmann  
**Subject:** RE: UCR Northern Pike Study

Hi Tom,

An update from Jeff Coronado/ALS on the selenium question:

We do have the hydride data for these service requests. However, it looks like Selenium was set to be reported from ICPMS in our LIMS system. We'll get the reports updated and send revised final reports and EDDs. Sorry for the confusion. ✓

Thanks,  
Cristy

---

Cristy Kessel  
Environmental Specialist  
Teck American Incorporated  
Mobile phone: 509.496.1160  
Email: [Cristy.Kessel@teck.com](mailto:Cristy.Kessel@teck.com)  
[www.teck.com](http://www.teck.com)

---

**From:** Tom Weinmann <[tweinmann@envstd.com](mailto:tweinmann@envstd.com)>  
**Sent:** Thursday, September 20, 2018 12:58 PM  
**To:** Kessel Cristy SPOK <Cristy.Kessel@teck.com>  
**Subject:** RE: UCR Northern Pike Study

Cristy,

I'm starting to look at the pike data and noticed a couple things.

Selenium was reported by Method 6020 rather than Method 7742 as recommended on Table 3 of the QAPP. The detection limit by 6020 is below the ACG from Table 2, so I don't imagine there will be an issue, but wanted to know if it's worth a mention in the report?

It looks like the lab set a 'collection date' for the composite samples to be the latest date of the individual fish samples included in the composite. I believe in past tissue studies the date of the earliest individual component was used as the 'collection date' for the composite. For these samples it only amounts to a day or two difference and does not affect the holding time at all, but again, wondering if it's worth a mention?

Let me know what you think. Thanks

-Tom

---

**From:** Kessel Cristy SPOK [<mailto:Cristy.Kessel@teck.com>]  
**Sent:** Wednesday, September 19, 2018 11:12 AM

## Tom Weinmann

---

**From:** Jeff Coronado <Jeff.Coronado@alsglobal.com>  
**Sent:** Friday, September 21, 2018 4:48 PM  
**To:** Tom Weinmann; Mark Harris  
**Cc:** Kessel Cristy SPOK (Cristy.Kessel@teck.com)  
**Subject:** RE: Request for SR K1807189  
**Attachments:** K1807189\_lipids\_RAW.pdf

Hi Tom,

It looks like there was a compiling error when the final report was assembled. The Lipids divider and bookmark are right in the middle of the TS raw data section and none of the Lipids raw data appears to be in the report. Mark will get the report recompile with the missing section and send out a revision. I've attached the missing raw data section for your reference. ✓

Jeff

**Jeff Coronado**  
Inorganics Manager, Environmental  
Kelso Laboratory



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---

**From:** Tom Weinmann [mailto:[tweinmann@envstd.com](mailto:tweinmann@envstd.com)]  
**Sent:** Friday, September 21, 2018 1:23 PM  
**To:** Jeff Coronado <Jeff.Coronado@alsglobal.com>  
**Cc:** Kessel Cristy SPOK (Cristy.Kessel@teck.com) <Cristy.Kessel@teck.com>  
**Subject:** Request for SR K1807189

Jeff,

Good afternoon. I'm looking at the northern pike tissue data for Teck in K1807189 and am missing the lipids raw benchsheet (equivalent of p.99 in K1807185). Could you please provide it when you get a chance? Thanks

Thomas H. Weinmann  
Senior Quality Assurance Chemist  
**Environmental Standards, Inc.**  
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# Lipids Raw Benchsheet

| Lab ID           | Client ID                 | Sample Weight (g) | Wt. Dish (g) | Wt. Dish + Lipid (g) |
|------------------|---------------------------|-------------------|--------------|----------------------|
| K1807189-006     | EPA-NP-B1                 | 2.029             | 1.2829       | 1.2843               |
| K1807189-012     | EPA-NP-B2                 | 2.087             | 1.2915       | 1.2933               |
| K1807189-018     | EPA-NP-B3                 | 2.014             | 1.3076       | 1.3101               |
| K1807189-024     | EPA-NP-B4                 | 2.041             | 1.3159       | 1.3179               |
| K1807189-030     | EPA-NP-B5                 | 2.041             | 1.3124       | 1.3150               |
| K1807189-036     | EPA-NP-B6                 | 2.048             | 1.2766       | 1.2793               |
| KQ1812195-06 MB  | Method Blank              | 2.087             | 1.2863       | 1.2863               |
| K1807189-006 DUP | Sample Duplicate          | 2.017             | 1.2834       | 1.2848               |
| K1807189-006 TRP | Sample Triplicate         | 2.004             | 1.2792       | 1.2811               |
| KQ1812195-05 LCS | Laboratory Control Sample | 0.934             | 1.3065       | 1.4950               |

|                                                 |                                       |
|-------------------------------------------------|---------------------------------------|
| Extraction Start Time/Date: <u>09:33 9/5/18</u> | Extraction Method: <u>3541</u>        |
| Extraction Stop Time/Date: <u>13:52 9/5/18</u>  | DCM Lot #: <u>D4264</u>               |
| Extracted By: <u>KRP</u>                        | Sulfate Lot #: <u>175176</u>          |
| Intermediate Volume of Extracts: <u>10mL</u>    | Aliquot used for % Lipids: <u>2mL</u> |
| Date Analyzed: <u>9/11/18</u>                   | Balance ID: <u>K-Balance 40</u>       |
| Analyzed By: <u>Williams</u>                    |                                       |

Prep Run #: 321177

Reviewed By: \_\_\_\_\_

*[Signature]*

Date: \_\_\_\_\_

9/14/18

## Tom Weinmann

---

**From:** Jeff Coronado <Jeff.Coronado@alsglobal.com>  
**Sent:** Monday, October 1, 2018 1:26 PM  
**To:** Tom Weinmann; Mark Harris  
**Cc:** Kessel Cristy SPOK (Cristy.Kessel@teck.com)  
**Subject:** RE: K1807597 requests  
**Attachments:** TIAs missing pages.pdf

Hi Tom,

Missing pages attached. We'll get a revised report and EDD put together and sent out to you guys. ✓

Jeff

**Jeff Coronado**  
Inorganics Manager, Environmental  
Kelso Laboratory



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---

**From:** Tom Weinmann [mailto:[tweinmann@envstd.com](mailto:tweinmann@envstd.com)]  
**Sent:** Friday, September 28, 2018 3:09 PM  
**To:** Mark Harris <[mark.harris@ALSGlobal.com](mailto:mark.harris@ALSGlobal.com)>  
**Cc:** Jeff Coronado <[Jeff.Coronado@alsglobal.com](mailto:Jeff.Coronado@alsglobal.com)>; Kessel Cristy SPOK (Cristy.Kessel@teck.com) <[Cristy.Kessel@teck.com](mailto:Cristy.Kessel@teck.com)>  
**Subject:** K1807597 requests

Mark,

I believe I'm missing a couple pages of raw data from the inorganic arsenic run in K1807597. I'm missing sample -016 and the CALVER that follows it, the package has -015 and then skips to the CALBLK. Could you please provide those couple pages when you get a chance?

Also, K1807597 has selenium reported by both 6020 and 7742 in the package and EDD. I'm guessing we probably only want to see the 7742 data to be consistent with the tissue samples.

Thanks



Thomas H. Weinmann

Senior Quality Assurance Chemist

**Environmental Standards, Inc.**

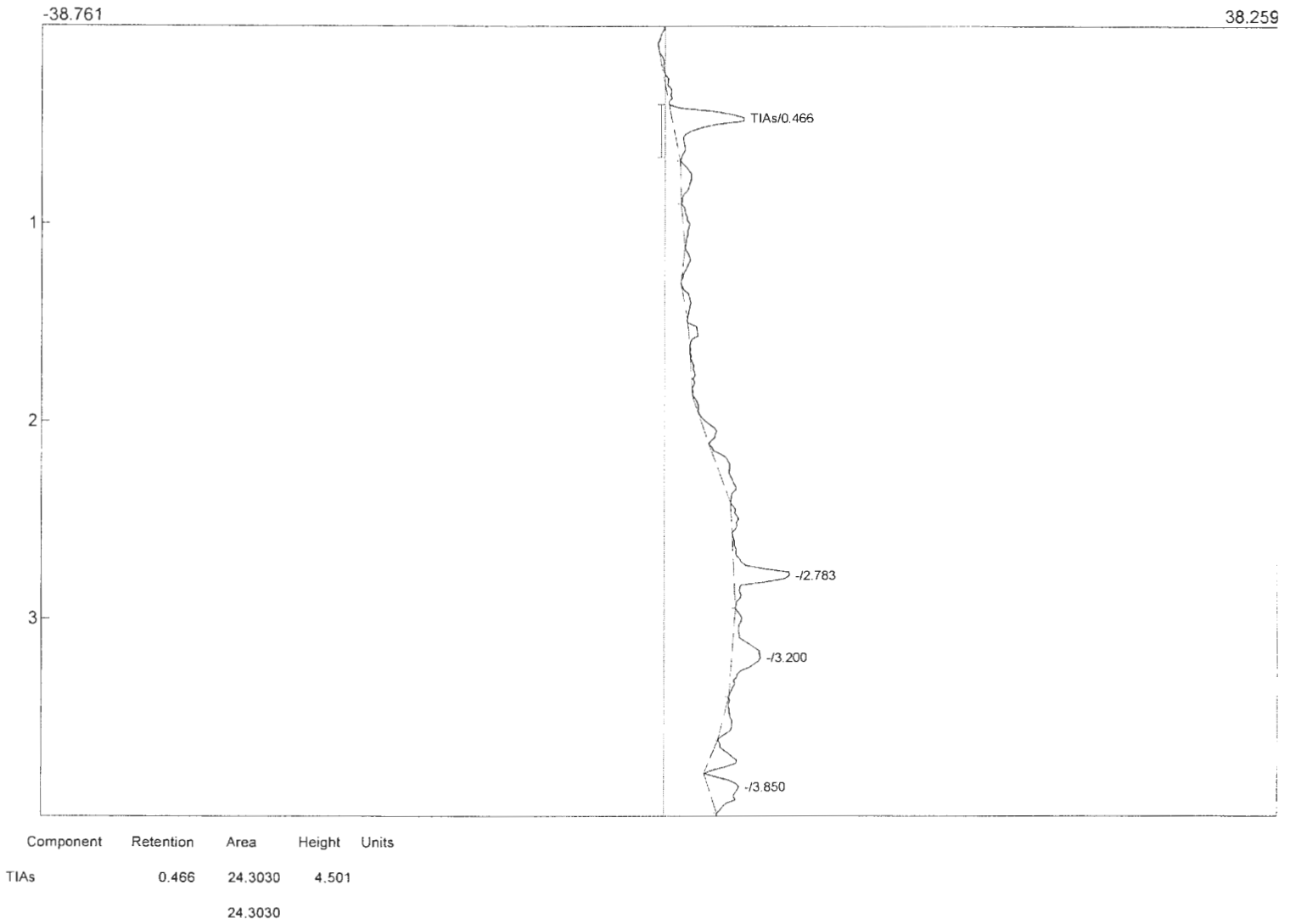
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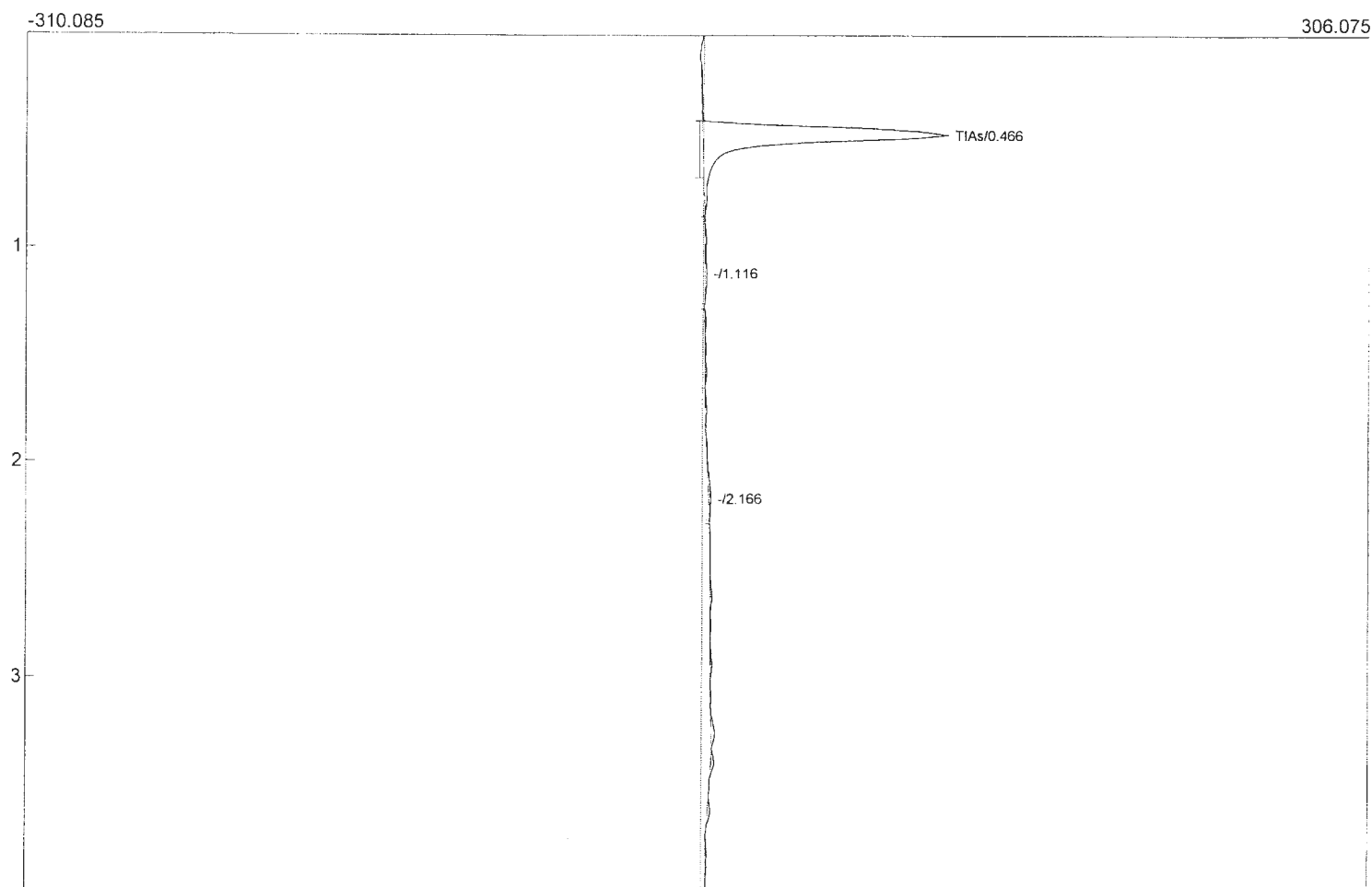
**Emergency Response Quality Assurance Hotline: 855.374.7272**

100

Lab name: ALS Enviromental  
Client: Arsenic Speciation  
Analysis date: 08/27/2018 15:53:19  
Method: 1632  
Description: FID-CHANNEL 1  
Column: 15% OV-3 Chromosorb  
Carrier: HELIUM  
Data file: K1807597-016 50ml.CHR ()  
Operator: EM



Lab name: ALS Enviromental  
 Client: Arsenic Speciation  
 Analysis date: 08/27/2018 16:00:57  
 Method: 1632  
 Description: FID-CHANNEL 1  
 Column: 15% OV-3 Chromosorb  
 Carrier: HELIUM  
 Data file: CALVER 4.CHR ()  
 Operator: EM



| Component | Retention | Area     | Height  | Units |
|-----------|-----------|----------|---------|-------|
| TAs       | 0.466     | 554.9920 | 112.527 |       |
|           |           | 554.9920 |         |       |

## Tom Weinmann

---

**From:** Jeff Coronado <Jeff.Coronado@alsglobal.com>  
**Sent:** Monday, October 1, 2018 5:58 PM  
**To:** Tom Weinmann; Mark Harris; cristy.kessel@teck.com  
**Subject:** RE: [SEIS-BULK?] Sample Confirmation from ALS Environmental for (K1807597)

Tom/Cristy,

Thanks for the note below. I understand more clearly what you are trying to do now. The "Tissue Homogenization" bench sheets lists the date each individual sample was homogenized (this date was omitted from the K1807597). The "Rinsate and Homogenization Blank Data" documents that preparation of the blanks for each day of processing (note: Rinsate Blanks are from the equipment used for the homogenization process prior to any work being done. Homogenization blanks are produced from the same equipment but they are taken between samples during the homogenization process.). The "Fish Fillet Composite Data" bench sheet documents the creation of the composites.

You are correct that all of the samples that make up a particular composite may not have been homogenized on the same day. So there would not be a 1:1 association between the blanks and composites. Given that and the fact that the individual homogenization dates weren't recorded for K1807189 I believe the best course of action would be to pool the blank results as you suggested. ✓

In reviewing the data I noticed that the rinsate and homogenization blanks for 8/3 (K1807185 page 96) do not appear on the blank login (K1807597). These sample were logged to end of K1807185 and placed on hold, so they were never analyzed. We'll need to get them added to K1807597 so we can get them analyzed and reported. We'll get this done ASAP. ✓

Cristy: Let me know if you would prefer a different course of action on this.

My apologies for all the confusion on this. Please let me know if there are additional questions.

Thanks.

Jeff Coronado  
Inorganics Manager, Environmental  
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Blank results associated with each  
tissue sample SDG were pooled.  
Highest result per analyte was  
used to evaluate contamination.

THW  
10/9/18

-----Original Message-----

From: Tom Weinmann [mailto:tweinmann@envstd.com]

Sent: Monday, October 01, 2018 2:03 PM

To: Mark Harris <mark.harris@ALSGlobal.com>; cristy.kessel@teck.com

Cc: Jeff Coronado <Jeff.Coronado@alsglobal.com>

Subject: RE: [SEIS-BULK?] Sample Confirmation from ALS Environmental for (K1807597)

Mark,

Thanks for the sample confirmation with the blanks identified by date.

I'm still trying to figure out if there is a way to associate the composite tissue samples with the blanks from a specific date? Is there anything that shows that the individual fish fillets that were composited into tissue sample X (K1807185-006, for example) were processed on Day Y and should be paired with the blanks from that date? What does tissue processing and homogenization involve? I imagine fish in a blender, but I'm guessing there's more to it than that. And at what point are the blanks collected? What is the difference between the rinsate and the homogenization blanks?

In the package for K1807185, can you explain what pages 92-100 are showing? It seems like this info is related to what I'm asking but I'm not quite sure how it all fits together. The homogenization log beginning on p.92 doesn't show anything happening on 8/14, but 8/15 and 8/17 are noted. It also looks like individual fillets for the same composite were processed on different days, so maybe a 1:1 mapping of sample to blanks by date is not possible? If that is true, would you say that pooling the results of all blanks associated with K1807185 (and K1807189 separately) would be a reasonable and representative approach to evaluate contamination?

There is some similar info starting on p.95 of the package for K1807189, but there are no dates reported for the specific fillets on the homogenization log like there is in K1807185.

Sorry for all the questions. I'm just trying to figure out how best to evaluate the data. Any additional info you can provide would be appreciated. Thanks

-Tom

-----Original Message-----

From: Mark.Harris@alsglobal.com [mailto:Mark.Harris@alsglobal.com]

Sent: Monday, October 1, 2018 6:52 AM

To: cristy.kessel@teck.com

Cc: Tom Weinmann <tweinmann@envstd.com>; Mark.Harris@alsglobal.com; jeff.coronado@alsglobal.com

Subject: [SEIS-BULK?] Sample Confirmation from ALS Environmental for (K1807597)

Importance: Low

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